Bell Ringer Activities

Each day place a bell ringer activity on the board. A bell ringer is a short activity that can be completed while you take attendance, collect homework, or other small chores. The activities should be read and comments made but do not necessarily get a grade. These activities should help you gain an understanding of your students' classroom knowledge as well as personal feelings, attitudes, and beliefs.

1. Place a single review question related to yesterday's instruction on the board. Ask students to write a response to the question. ***(This bell ringer will give you a quick glance regarding student understanding.)***

2. Ask a safety question. Ask students to explain what will happen with a safe practice and what could happen if proper safety is not followed.

3. Ask students: "Describe your favorite teacher, other than me."

4. Collect a few newspapers (Winchester Sun, Lexington Herald-Leader, USA Today, Smoke Signals). Ask students to look through a page or two of the paper, pick out an item in the paper, and write a paragraph or brief page on what they found. ***(Students can use any item in the paper—an article, advertisement, movie listing, obituaries, cartoons, etc. Let their imagination take them where they want to go. After your chores, ask one or two students to share what they found.)***

5. Turn the television onto CNN or some other news channel. Ask the students to write an opinion or comment on what they hear.

6. Purchase a few trade magazines. Have students find an article to review. Ask students to read the article. ***(Students may only have time to select an article and read only a portion of it. You can use this over multiple days.)***

7. Find an interesting article in a magazine or paper. Duplicate the article for each student. Ask students to read the article. Write one or two questions on the board for students to answer regarding the article.

8. Ask students: "Where do you want to be in five years? Explain"

9. Ask students: "What do you believe are your strengths and weaknesses? Make two columns and list strengths and weaknesses." ***(Any type of question that may be asked during an employment interview is good practice for the students.)***

10. Ask students: "What do you plan to do after graduation—college or work? Explain specifically where you plan to be and why? If you haven't planned, list five college majors or employers you may be interested in knowing more about.

11. Ask students: "You are the principal of the school. What rule would you implement or delete? Why?"

12. Bring in an odd or antique tool of the trade or a piece of unusual looking equipment. Have students write down what they think it is and how it works.

13. Ask students: “You see a student stealing a tool from the shop. What do you do?”

14. Give each student a city map of Winchester. You can get these free from the Chamber of Commerce or City Hall. Ask students to make with a highlighter where they live, the Area Technology Center/high school, and their four favorite places—friends home, Walmart, movie theater, Dairy Queen, etc.

15. Ask students: “Tell me who you most admire. Why?”

16. Ask students: “Tell me your favorite meal include drink and dessert.”

17. During the peak ball season, ask students: Do you plan on attending the game. Why or why not?”

18. Ask students: “Where would be your ideal vacation spot?”

19. Ask a math question or problem related to your previous lesson.

20. Ask students: “Describe your best friend.” ***(This question many times will give you insight into your student because he/she will tend to describe qualities that they also possess.)***

21. Ask students: “Write a brief description of where you see yourself in ten years.”

22. Ask students: “What has been your favorite activity in the class so far?” Ask this about ¼ of the way through the year to get a gauge of student likes and dislikes.

23. Ask students: “Tell me about a conflict you have had with another person. How did you resolve it?”

24. Ask students: “Identify a list of adults you feel are your greatest supporters. Tell why.”

25. Ask students: “Identify your favorite song and band/singer. Why do you enjoy their/his/her music?”

End of Class Activities

1. Ask students to write a letter to a student who is absent. Let them tell the activities of the day and what was learned. ***(This will help you check for understanding as well as give the absent student guidance on what was missed.)***

2. Pair up students. Have each student tell his/her partner what they learned or what they enjoyed most about the class that day. Ask each pair to write one sentence describing their discussion.

Activities For "I Need a Break" Sessions

1. Begin a story with one sentence on the board. Place students in teams. One student begins by adding one sentence to the story and passes the paper to the next student in the team. That student will add one sentence to the story and pass to the next student in the team. Continue the pattern. At the end choose one student to read the team's story.

2. Pick an activity from the "Why Try" series.

3. Develop a library of DVD's—fun movies that portray someone in the trade or focus on the industry. PG only.

4. Play a review game with the students. Take questions from the next test and develop a game.

5. Art Project—ask student to draw something related to the trade.

Russell Area Technology Center

Mr. Shawn Parsons

Room 120

Bell Ringers

Architectural Design

Introduction to Architecture

Bell Ringers

Print Date and Day

Give a conclusion of your thoughts, Ideas, any previous knowledge, or any question you may have.

Answer may be several sentences up to a paragraph.

More than one may appear on a single page.

Bell Ringer # 1

What is your definition of Architecture ?

Bell Ringer # 2

Do you like classical, Traditional or Modern styles of architecture?

Bell Ringer # 3

Introduction to Architecture

Compare the difference of an Cooperative and a Condominiums?

Architecture Design

Which career seemed to be most interesting to you, please explain?

Bell Ringer # 4

Introduction to Architecture

What style of home design sticks in your mind from chapter one and why?

Architecture Design

What is does it mean when a job requires “practical experience” in addition to a degree?

Bell Ringer # 5

Introduction to Architecture

The American with Disabilities act is a civil rights statute not a building code. Why do we need to study this in Architecture?

Architecture Design

If you were to seek a Co-op or Work Study at Russell ATC what area would you like to experience?

Bell Ringer # 6

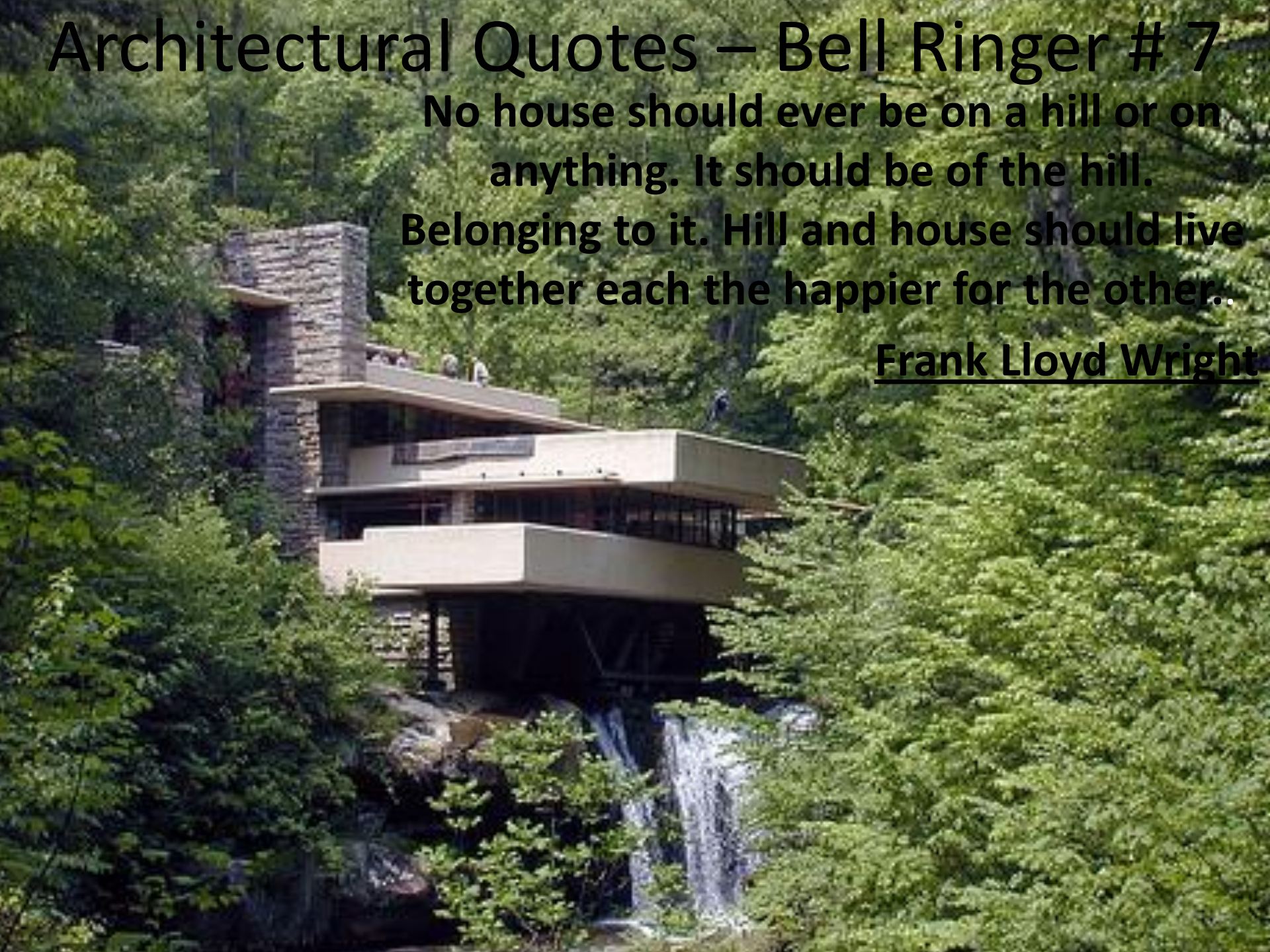
Introduction to Architecture

The American with Disabilities act is a civil rights statute not a building code. Why do we need to study this in Architecture?

Architecture Design

If you were to seek a Co-op or Work Study at Russell ATC what area would you like to experience?

Architectural Quotes – Bell Ringer # 7



No house should ever be on a hill or on anything. It should be of the hill. Belonging to it. Hill and house should live together each the happier for the other..

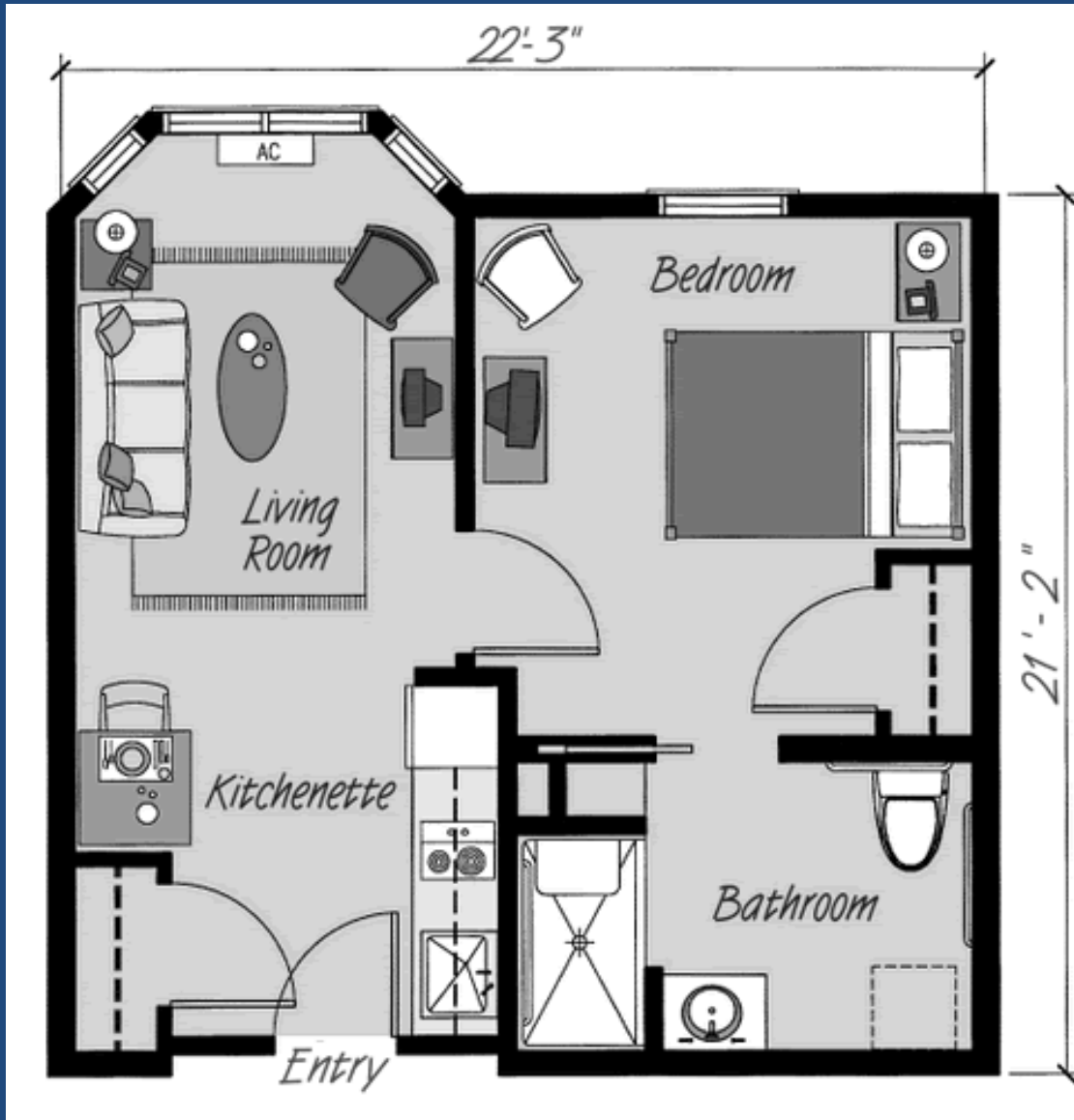
Frank Lloyd Wright

Bell Ringer # 8

Introduction to Architecture

Why is understanding traffic flow important

In home design?

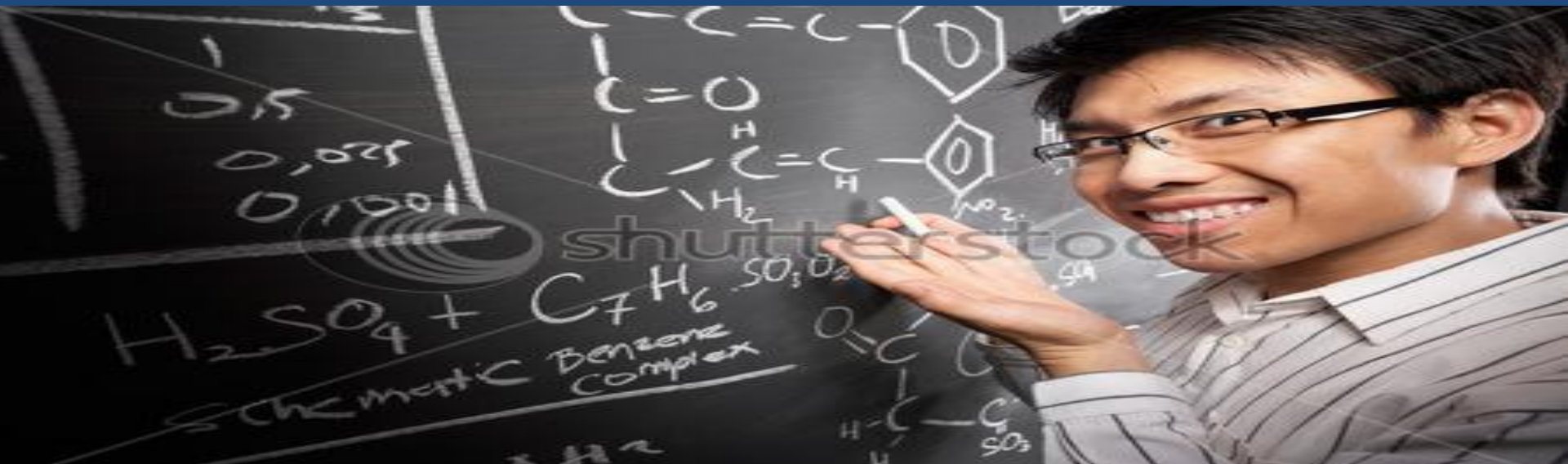


Bell Ringer # 8

Architecture Design

What do you think are the advantages / disadvantages of working while in High School?

Even if the job is totally unrelated to what you plan on doing in the future?



Bell Ringer # 09

Introduction to Architecture

Lot selection is an important factor of Architecture. How can the Lot effect the Homes Design?

Architecture Design

Why do you think employers want soft skills along with the technical skills?

Bell Ringer # 10

Introduction to Architecture

How does room Planning and Traffic flow effect one another?

Architecture Design

What type of jobs does your job inventory say are best for you? Why?

Bell Ringer # 11

Introduction to Architecture

List requirements for a proper bedroom design?

Architecture Design

What in your opinion is the most important part of a job interview?

Bell Ringer # 12

Introduction to Architecture

How ADA effect the sleeping area of a residential home ?

Architecture Design

What skills can you learn in High School that would help you get a job?

Bell Ringer # 13

Introduction to Architecture

Does the Bedroom layout shown seem practical for a typical teenagers room today?

Bell Ringer # 13

Architecture Design

Why do you think you get nervous before an interview? Please explain, what thoughts go through you head? Do you rehearse questions or try to predict what happens?

Architectural Quotes

Form follows function - that has been misunderstood. Form and function should be one, joined in a spiritual union.

Frank Lloyd Wright

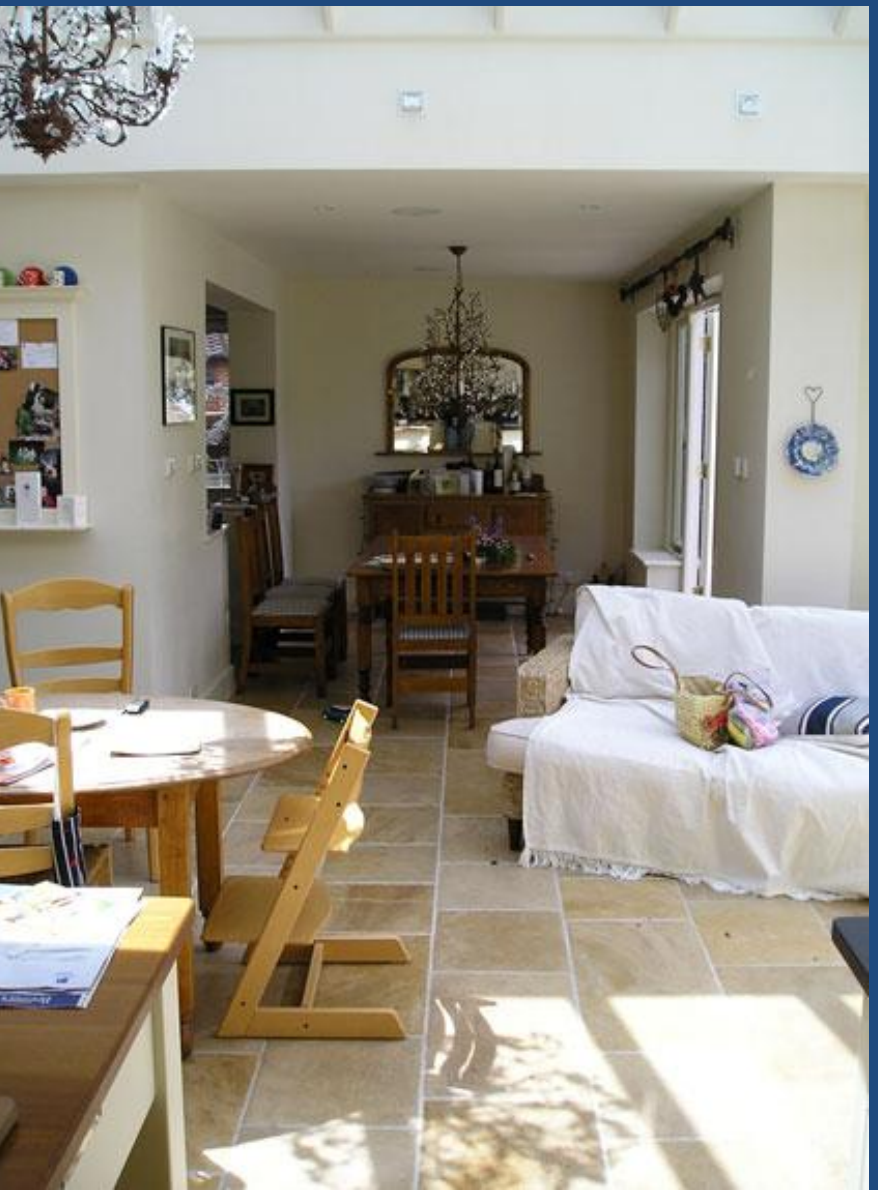
What do you think he meant by this? House does function affect the form of your house?

Bell Ringer # 15

Introduction to Architecture

What is the difference between ½ bath, Full bath, and a Luxury bath. ?

Bell Ringer # 16



Introduction to Architecture

What types of activities happen in your living area of the home? Also, is your home designed for such activities?

Bell Ringer # 17

Introduction to Architecture

What locations do you have that extend the living area outside? What types of activities happen in these areas of your home?

Bell Ringer # 18

Introduction to Architecture

Describe your main entry into your home? Do you have a foyer? How can you improve the entrance?

Bell Ringer # 19

Introduction to Architecture

Is this an open or closed plan? What type of plan Do you have ? Please Describe?

Bell Ringer # 20

Introduction to Architecture

Do you have a special purpose room? What type of room would you like to have and why?

Bell Ringer # 21

Introduction to Architecture

Describe the shape of your kitchen? Do you know what design of kitchen you have? Is it Functional?

Bell Ringer # 22

Introduction to Architecture

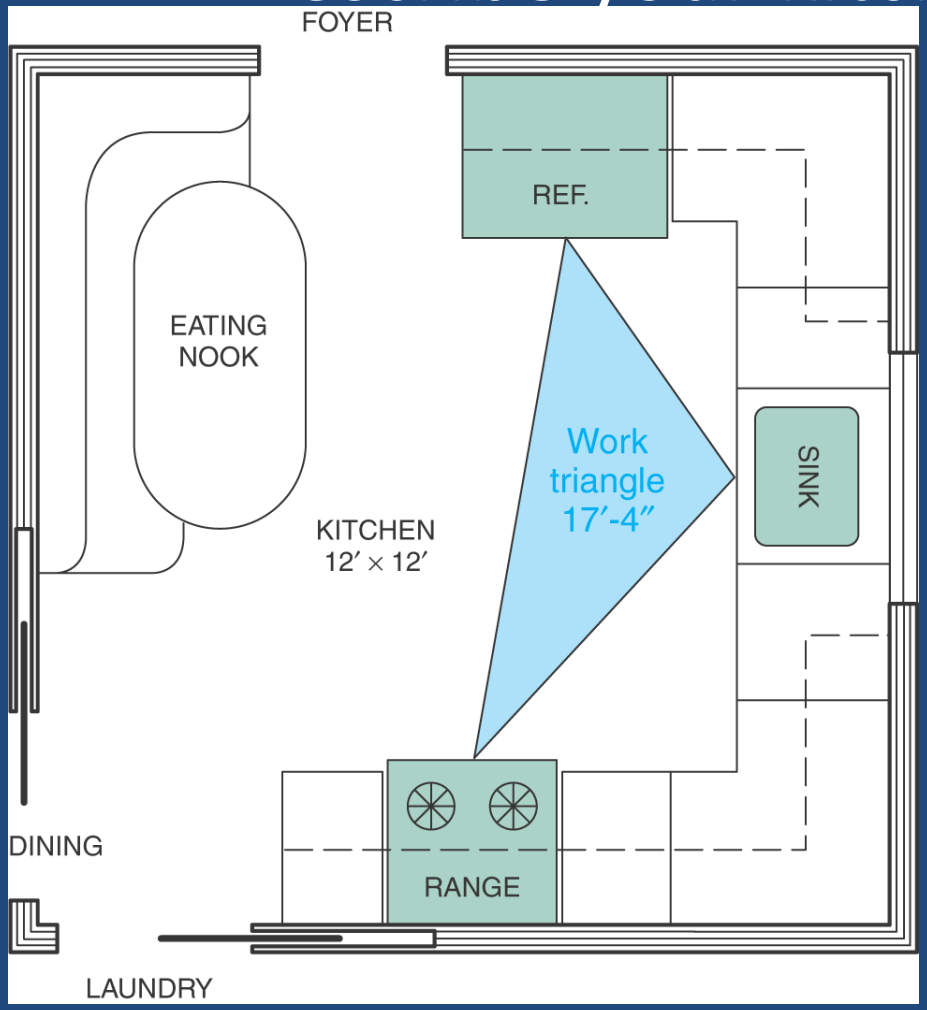
Describe your homes clothes care facilities?

Is it Functional?

Bell Ringer # 23

Introduction to Architecture

Describe your kitchens work triangle.



Is it Functional?

What are some Pros or cons to your kitchen?

Architectural Image – Bell Ringer # 24

Where is this structure located?

What do you Identify with this Structure?

<u>What can you tell me about this structure?</u>

Bell Ringer # 25

Introduction to Architecture

Do you have a Garage or Carport?

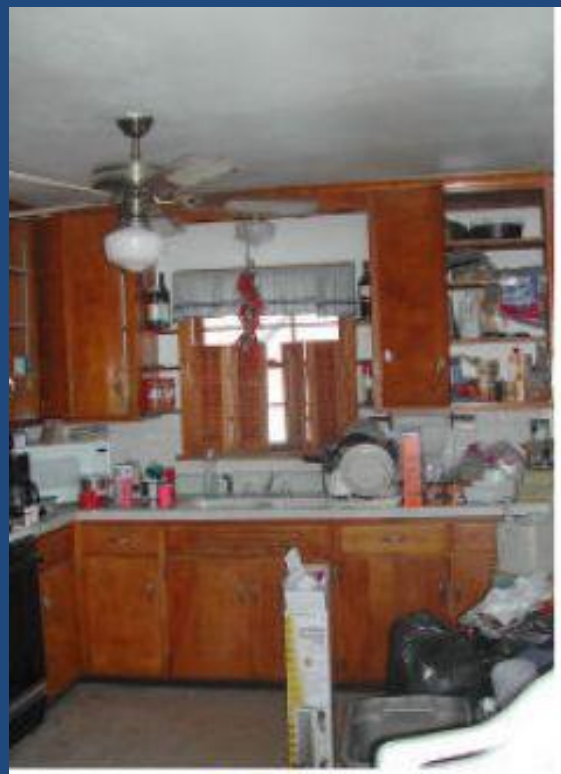
What are some Pros or cons for having a garage?

What activities or function would your dream garage have?

Bell Ringer # 26

Introduction to Architecture

Name one thing you have noticed about your house that you could change to make a better home since taking this course. Would this be an easy change to make? What about cost or relocation?



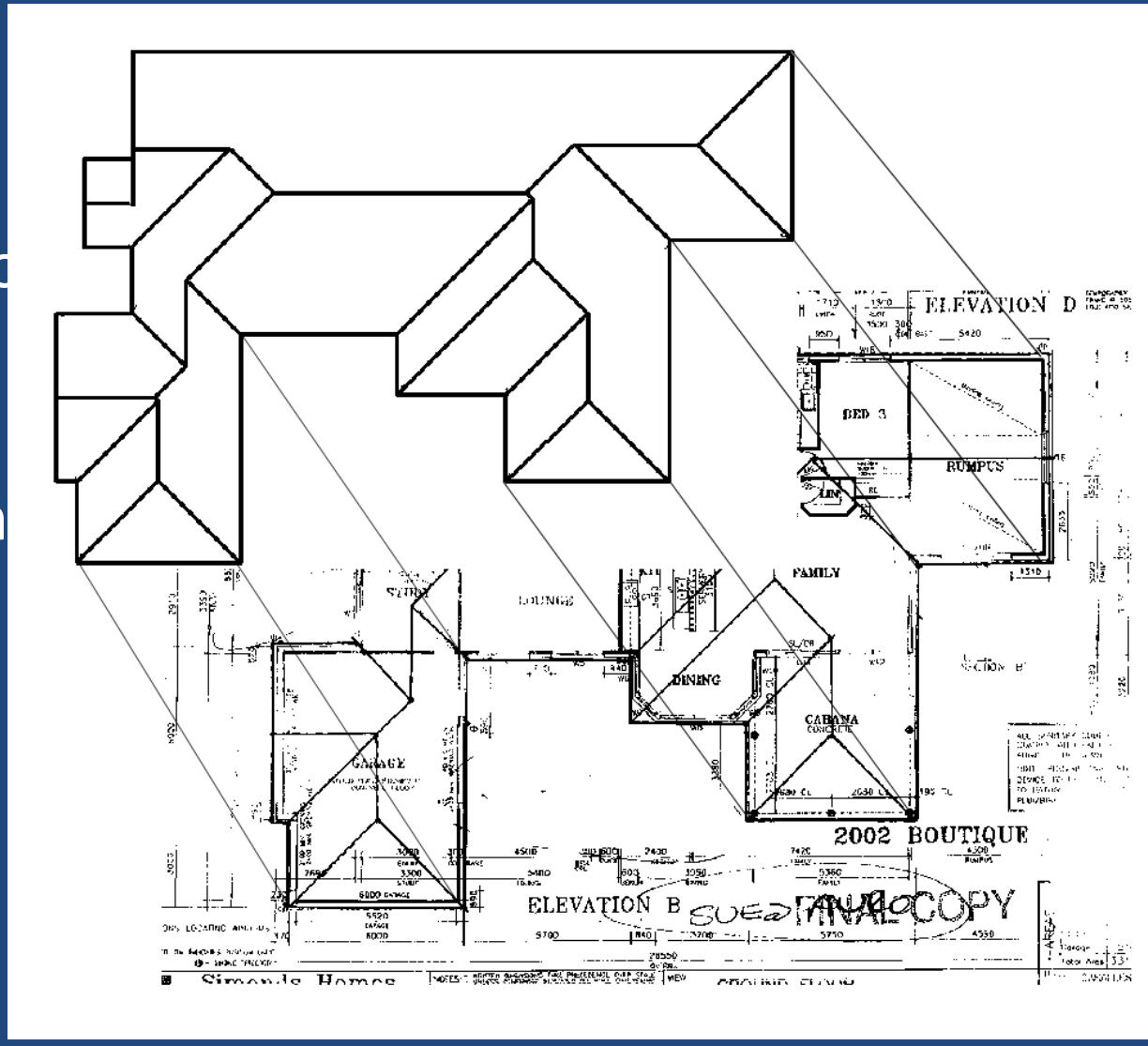
Before...

...& After

Bell Ringer # 27

Introduction to Architecture

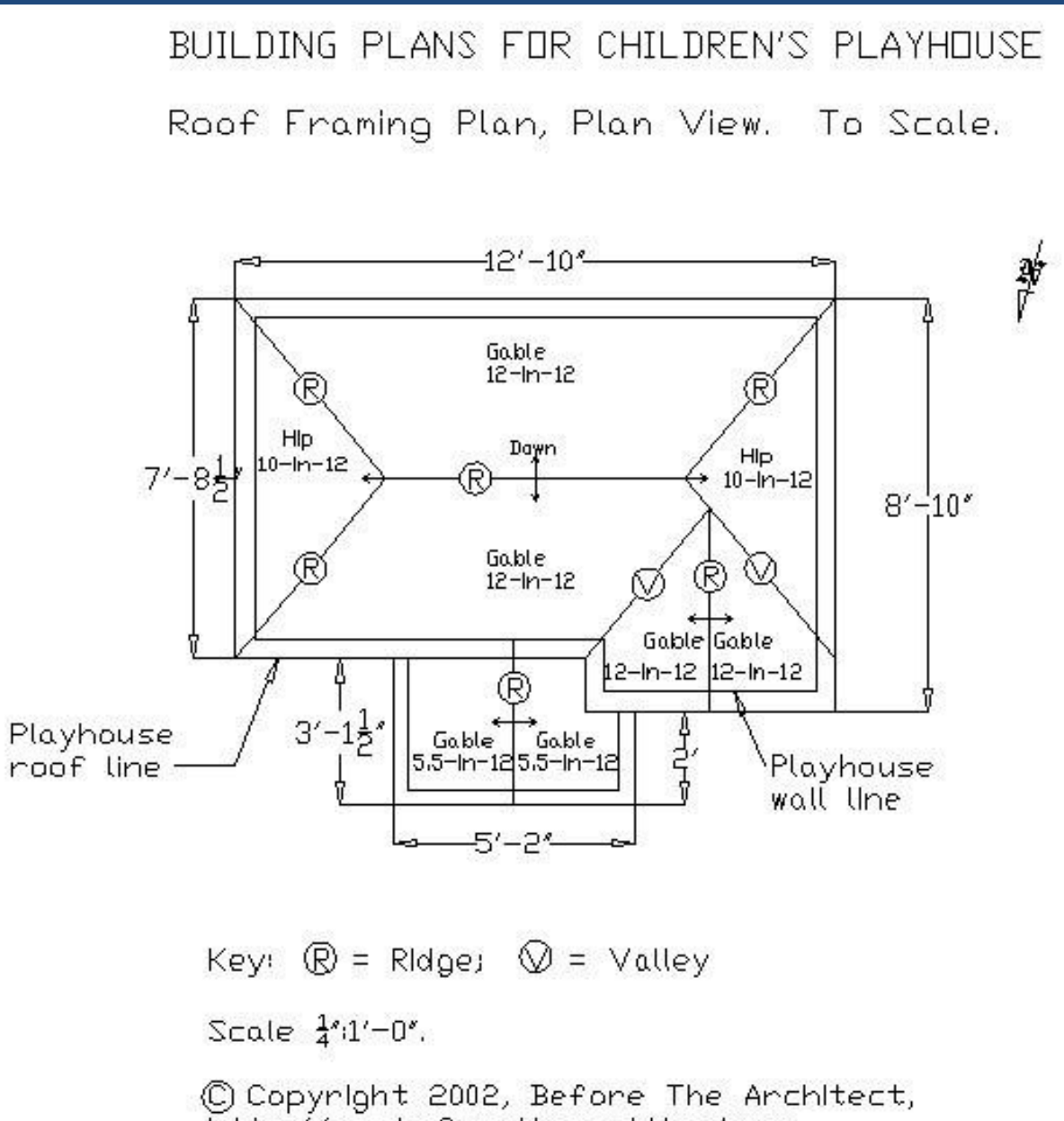
Name what type of roo
is on your home? Is it
complicated design?
Can you make a sketch
of the roof plan.



Bell Ringer # 28

Introduction to Architecture

Can you make a sketch of the roof plan.



Bell Ringer # 29

Introduction to Architecture

Have you ever been in the attic of your home or another home?

Was it used for storage?

Describe the attic access?

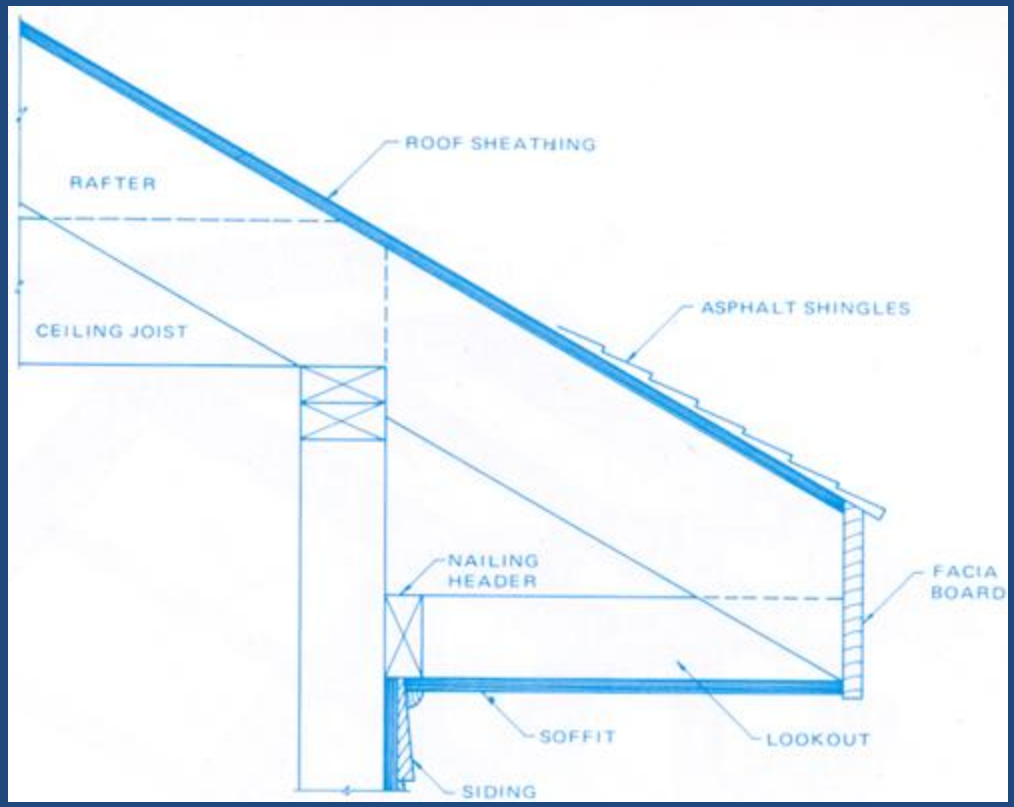
Pouring and leveling Zonolite Insulation Fill.

Bell Ringer # 30

Introduction to Architecture

What type of cornices are on your home? Are they plain or decorative?

What materials do you think they are constructed of?



Bell Ringer # 30

Introduction to Architecture

What type of roof is on this home? What type of home is it? What decade or era do you think it was designed?

What materials do you think they are constructed of?

Bell Ringer # 31

Introduction to Architecture

How many materials can you name from **Your** home's elevation? What features do you recognize?

Bell Ringer # 32

Introduction to Architecture

What do you think you could change on your home to make the biggest overall effect to the elevation?

Bell Ringer # 33

Introduction to Architecture

Name some features of your yard (Plot Plan). Is it flat, hilly, trees, creaks, cit or county. Do you have landscape features, pools fences and etc.?

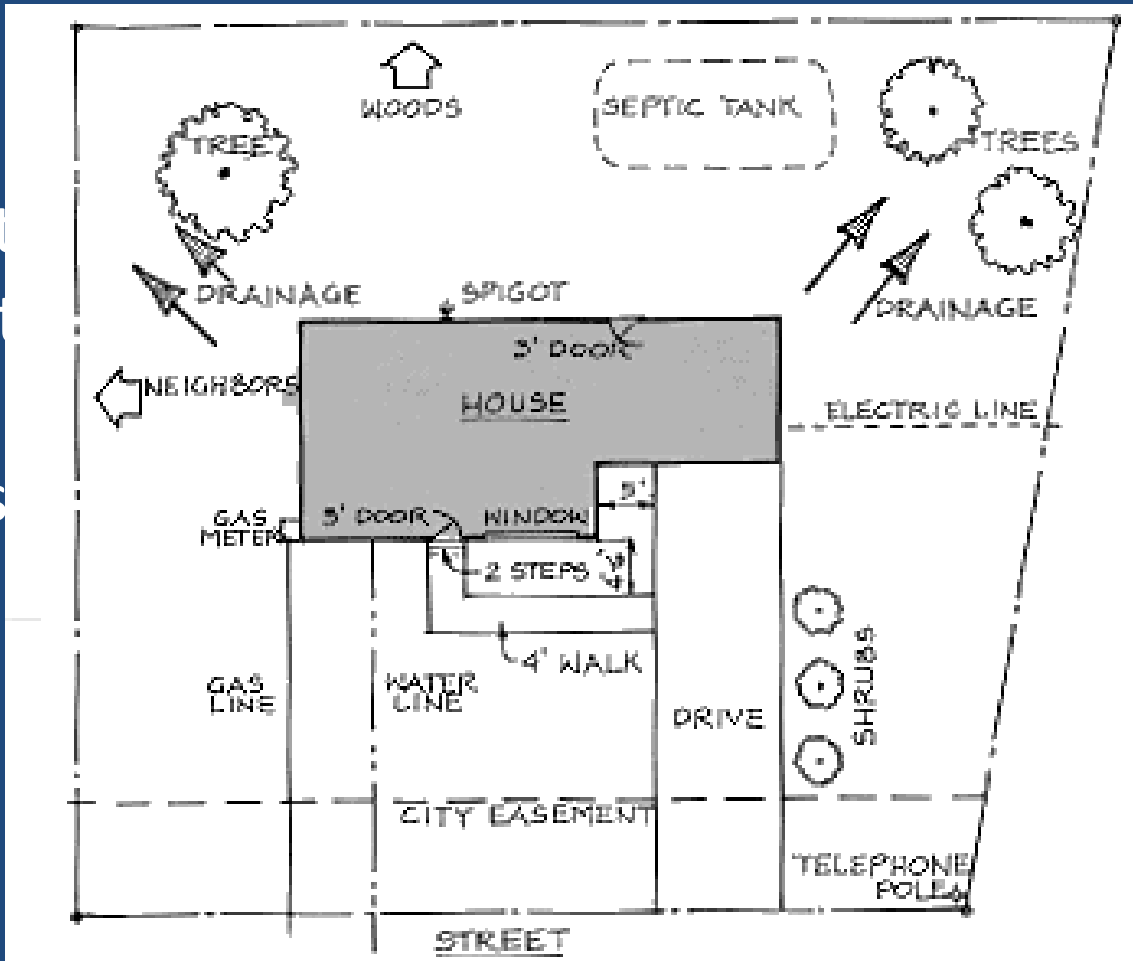


Figure 3. Existing features marked on the plot plan.

Bell Ringer # 34

Introduction to Architecture

Do you know the orientation of your home reference to the lot? Whi side of your house faces south? How can you tell?

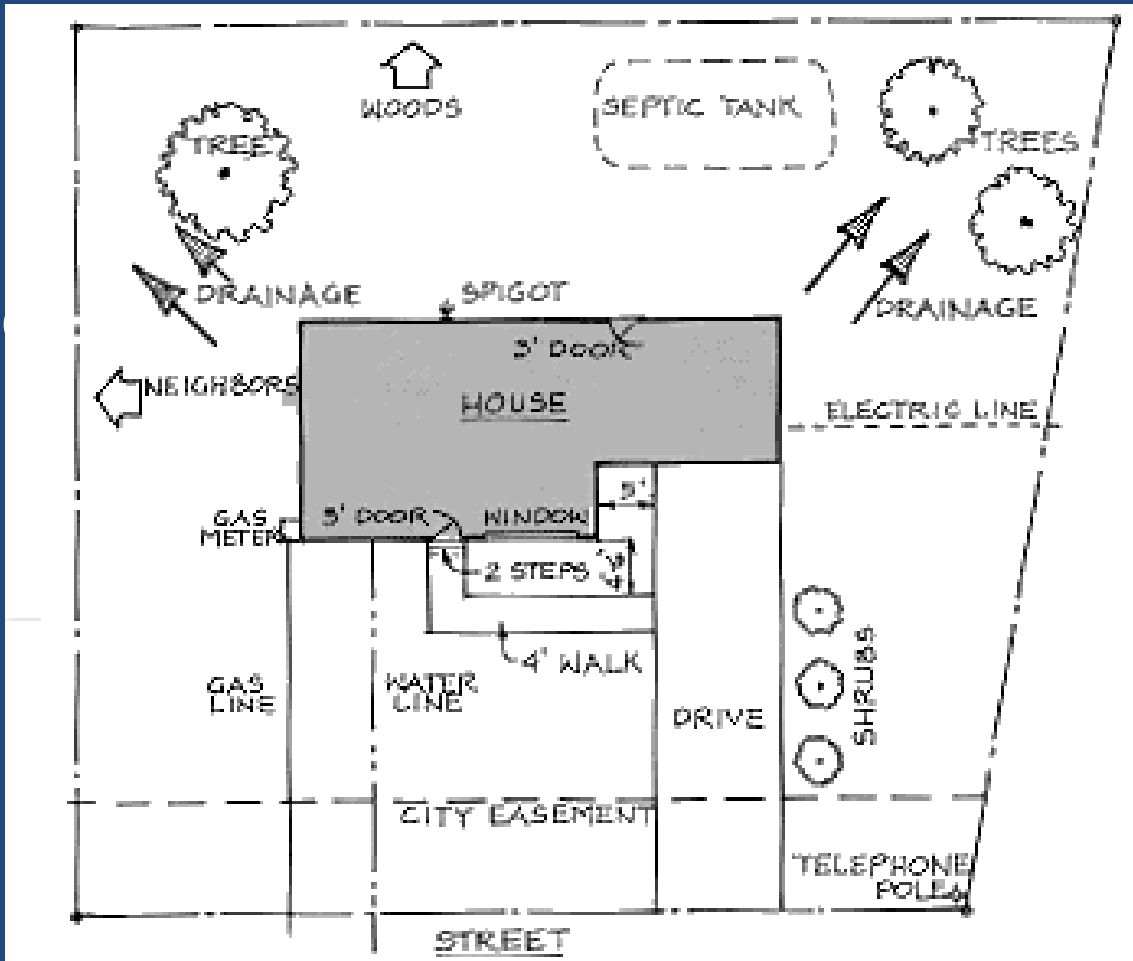


Figure 3. Existing features marked on the plot plan.

Bell Ringer # 35

Introduction to Architecture

Do you know the size of t
lot your home is located
on? Where would you get
such information? Which
document(s) shows this?

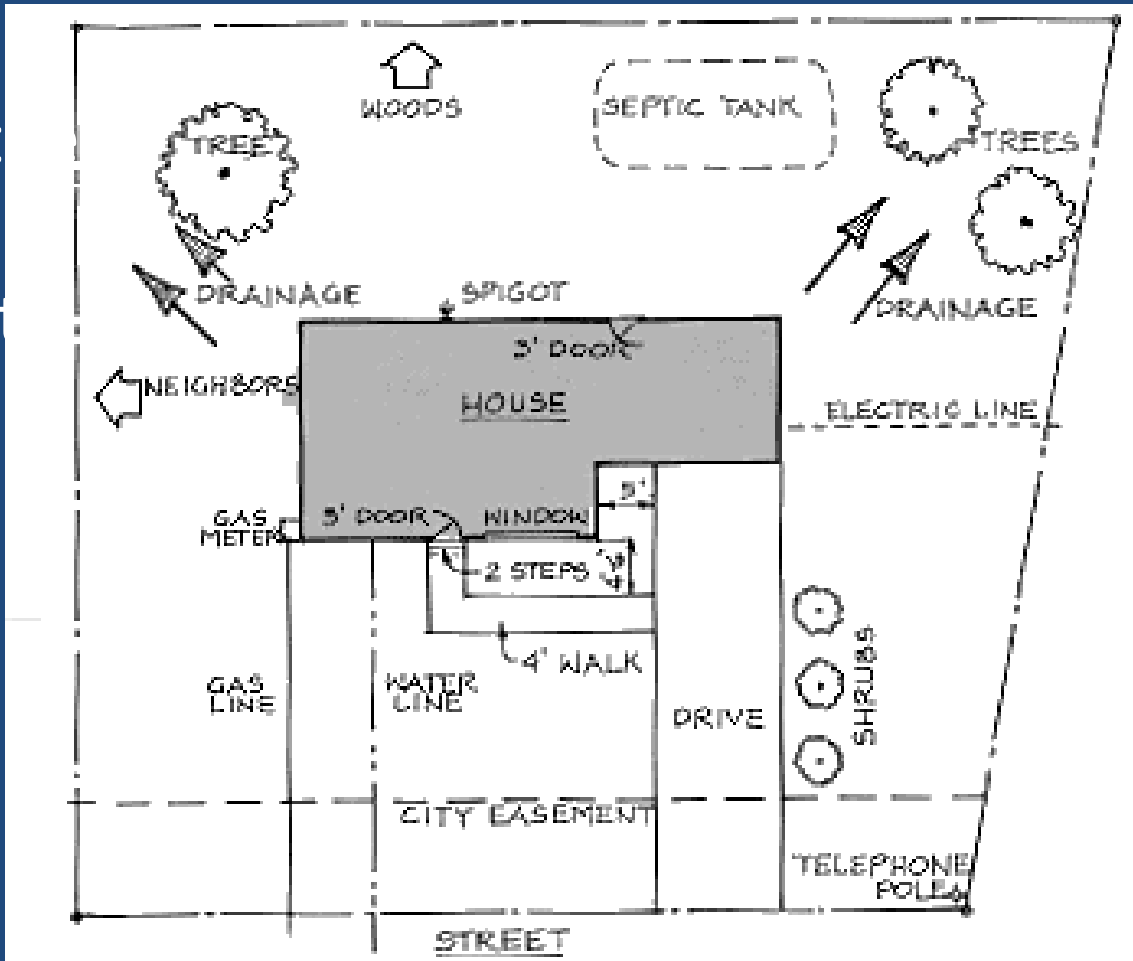


Figure 3. Existing features marked on the plot plan.

Bell Ringer # 35

Introduction to Architecture

Do you know the size of t
lot your home is located
on? Where would you get
such information? Which
document(s) shows this?

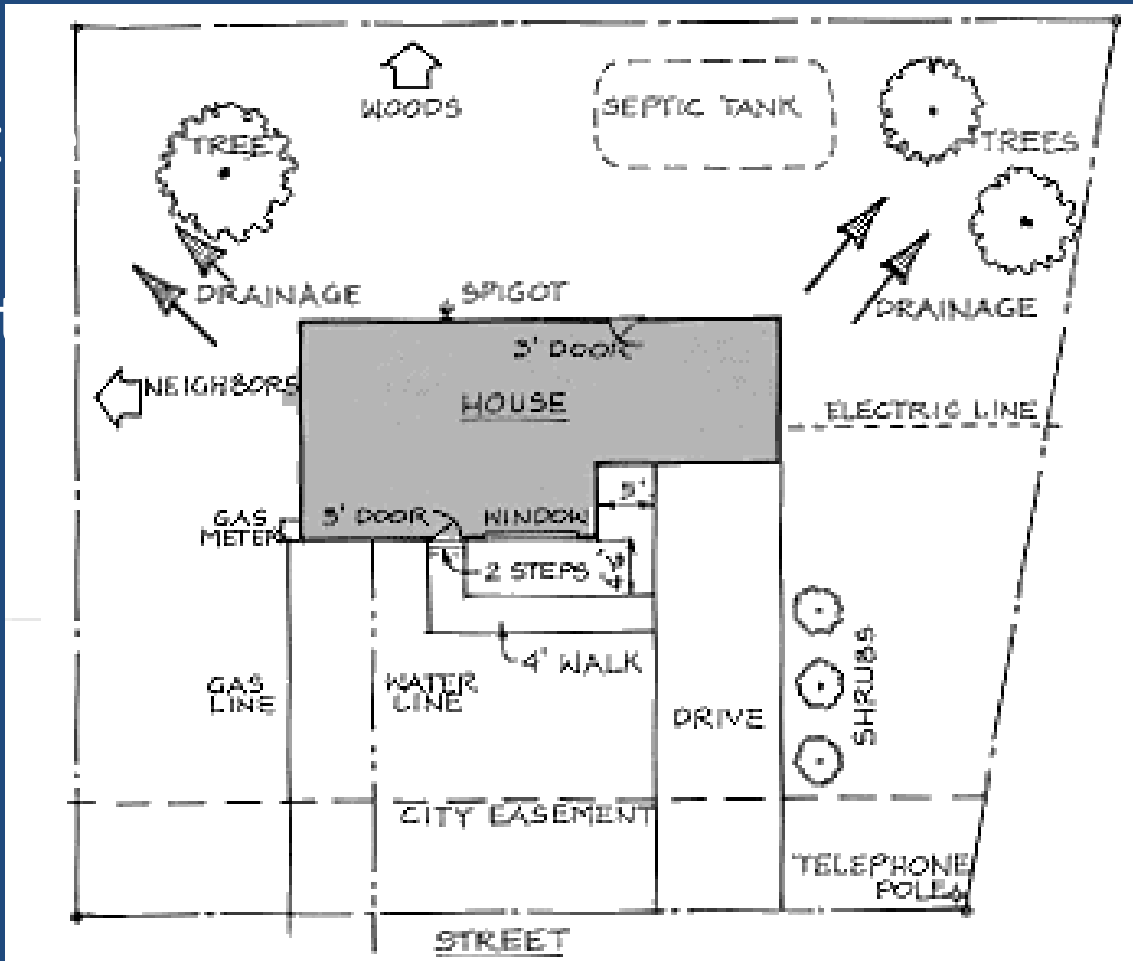


Figure 3. Existing features marked on the plot plan.

Architectural Image – Bell Ringer # 36

Where is this structure located?

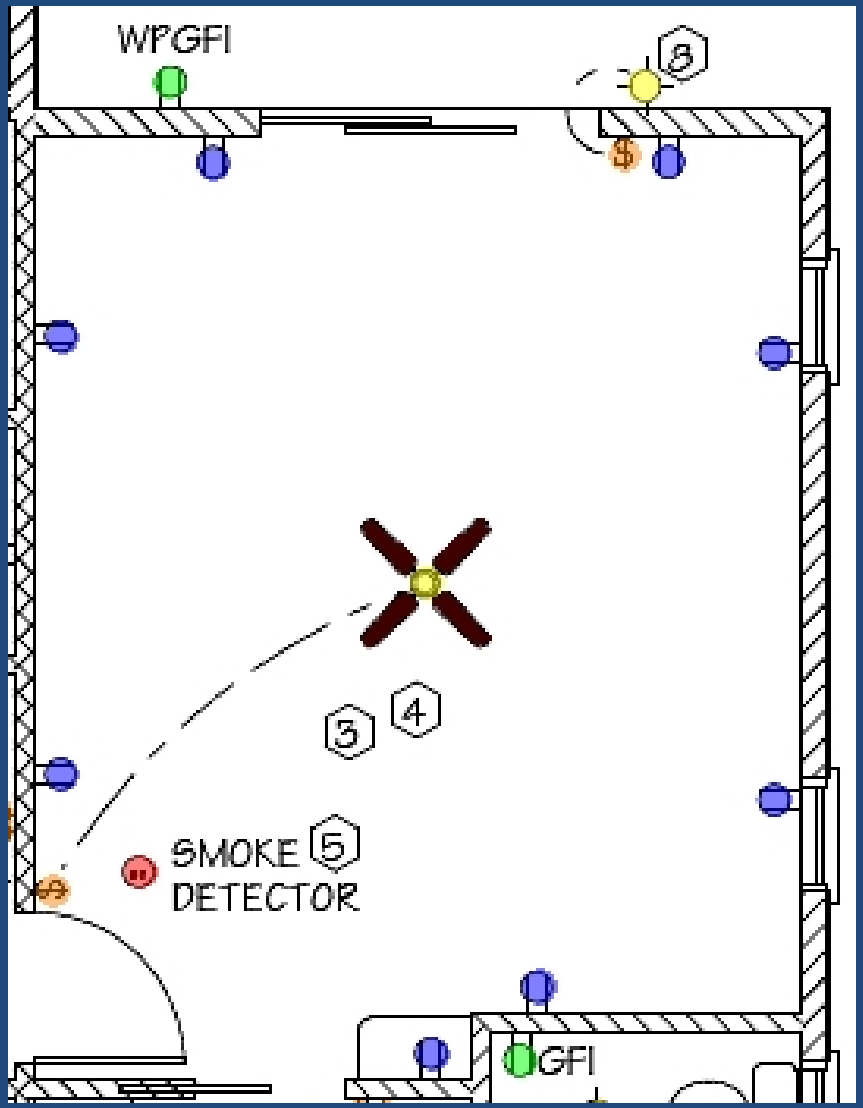
What do you Identify with these Structures?

<u>What can you tell me about these structures?</u>

Bell Ringer # 37

Introduction to Architecture

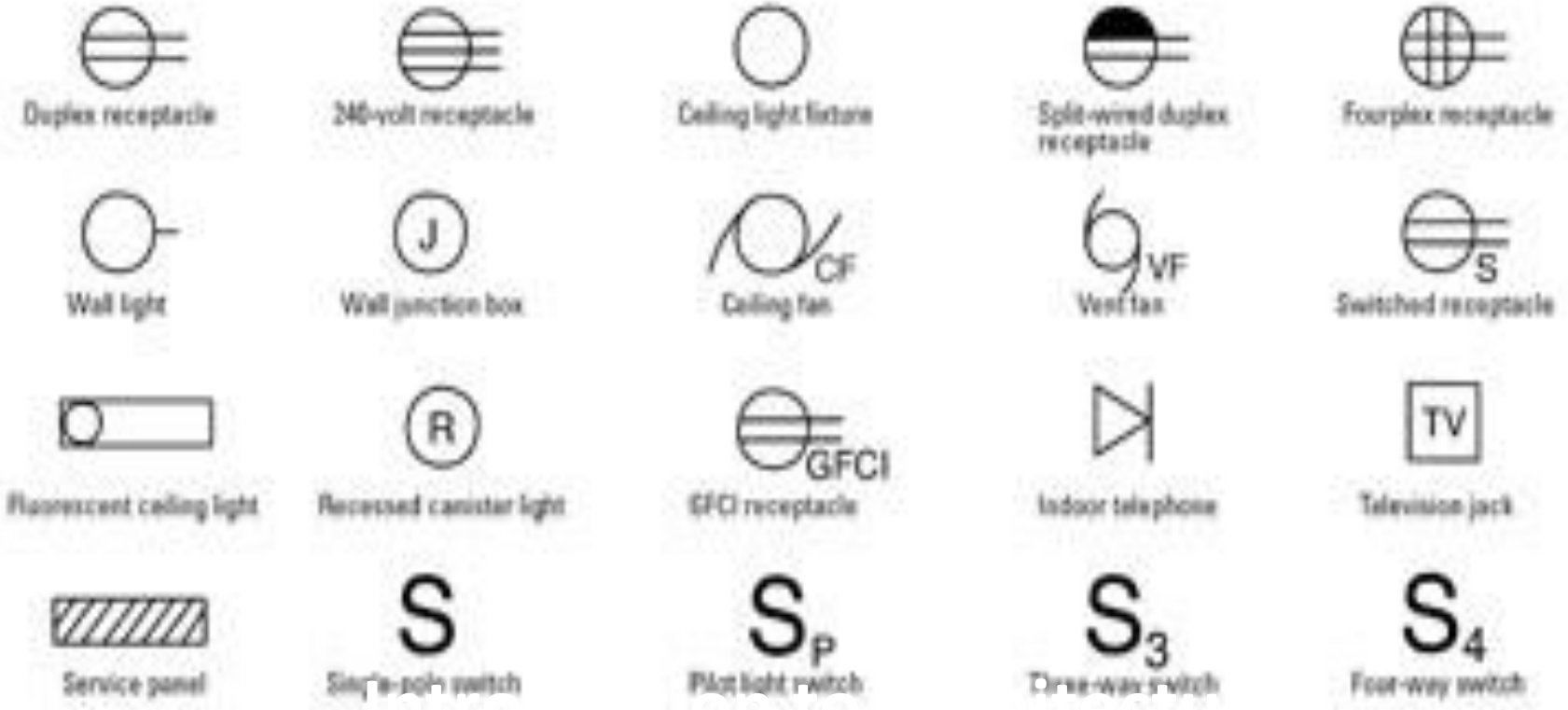
Do you know the amount of electrical outlets in your room? Do you have enough or do you have extension cords and/or surge protectors? What types of electronic equipment do you have in your room?



Bell Ringer # 38

Introduction to Architecture

Copy each of these symbols in your journal?



Note the names of these symbols and remember them.

You will have a quiz on Friday.

Bell Ringer # 39

Introduction to Architecture

Do you know where the electrical panel is located in your home? Can you identify a tripped breaker?

What size of electrical Service do you have in your Home?

Architectural Image – Bell Ringer # 40

Where is this structure located?

What do you Identify with this Structure?

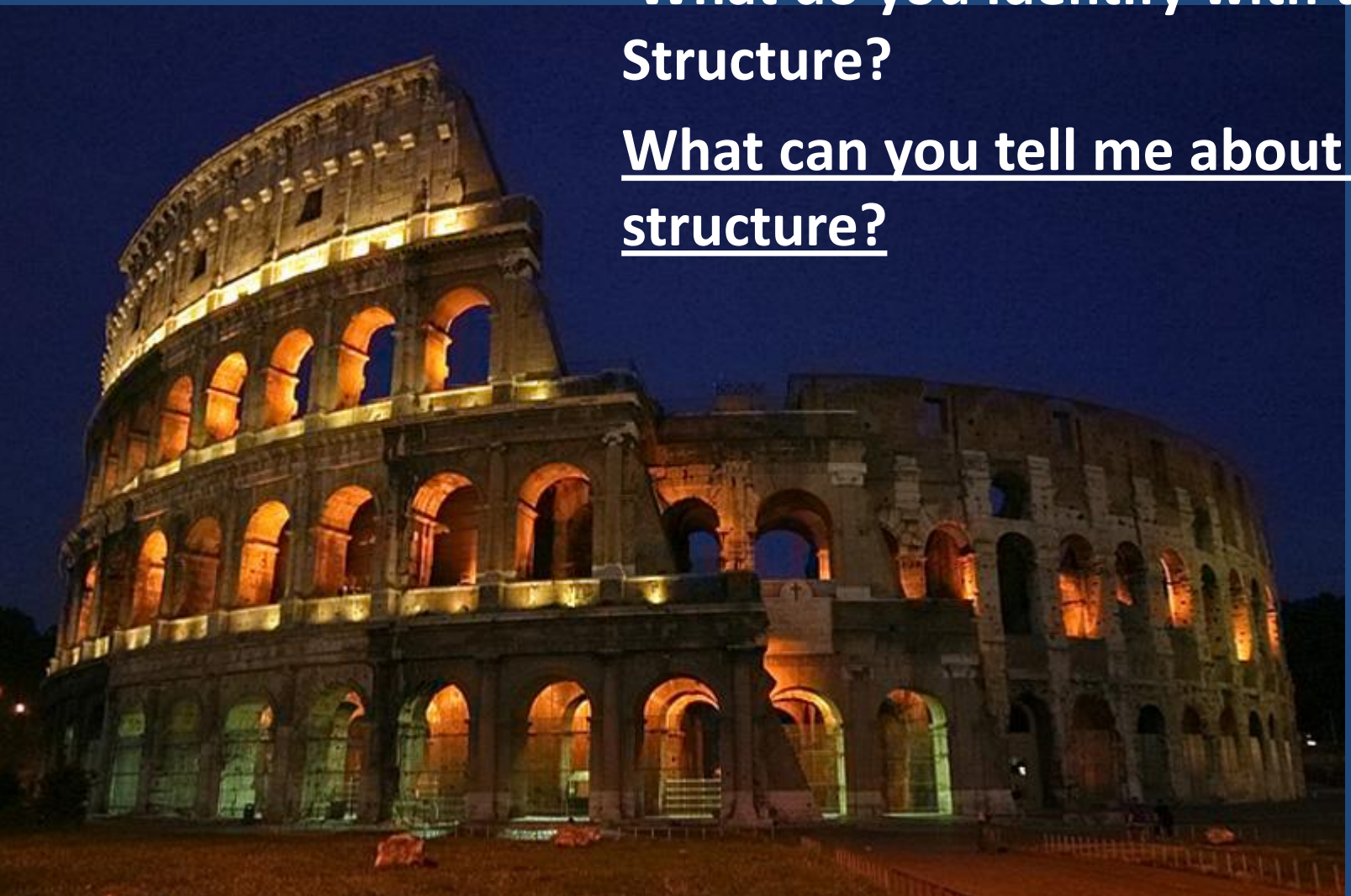
<u>What can you tell me about this structure?</u>

Architectural Image – Bell Ringer # 41

Where is this structure located?

What do you Identify with this Structure?

What can you tell me about this structure?



Architectural Image – Bell Ringer # 42

Where is this structure located?

What do you Identify with this Structure?

<u>What can you tell me about this structure?</u>

Architectural Image – Bell Ringer # 43

Where is this structure located?

What do you Identify with these Structures?

<u>What can you tell me about this structure?</u>

Architectural – Bell Ringer # 44

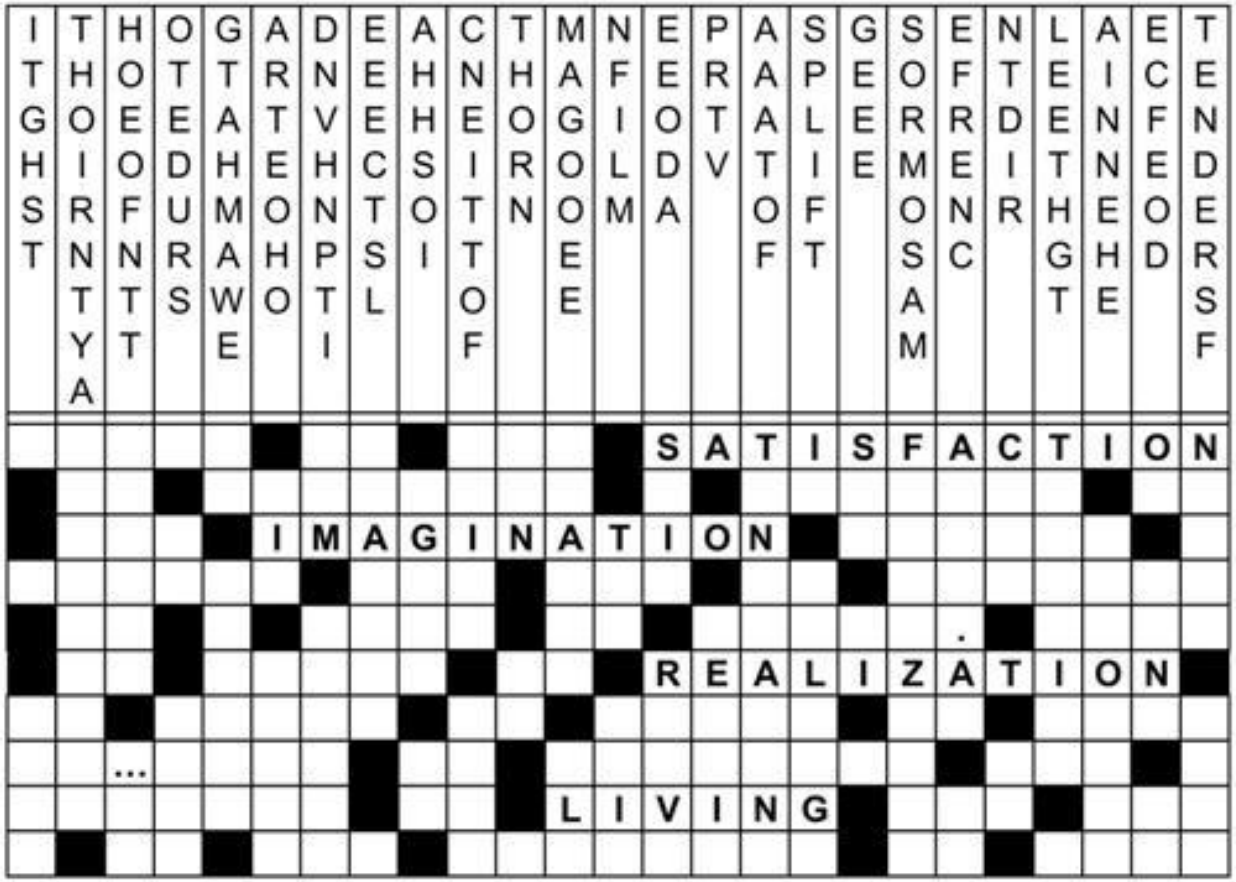
Sketch the puzzle and complete?

							7	
	9	7			2		5	
	8		4	7	6			2
6	4							
			2		5			
							3	9
7			8	1	3		2	
	1		6			8	9	
	3							

Architectural – Bell Ringer # 45

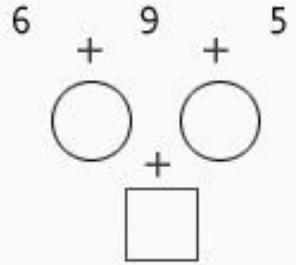
Instructions:

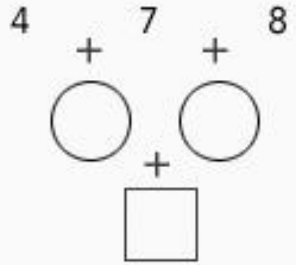
Unscramble the hidden message by dropping the letters down into the appropriate boxes. Each letter from the upper portion of the puzzle goes into one square, in the same column, in the lower portion of the puzzle. The order of the letters within each column is scrambled.



Architectural – Bell Ringer # 46

Instructions: Add the first and second numbers, then the second and third. Combine.





Instructions: Complete these 10 simple equations in less than 20 seconds. Seem too easy? Even basic math requires focus.

9 x 6
13 - 8
15 ÷ 3
5 x 8
18 ÷ 2
21 - 9
6 x 4
12 + 7
14 ÷ 2
5 x 11

Architectural – Bell Ringer # 48

Solve the problems.

Add.

1.

5 feet 6 inches
+ 4 feet
9 feet 6 inches

2.

7 inches
+ 3 feet 2 inches

3.

3 ft. 4 in.
+ 7 ft. 5 in.

4.

6 wk. 4 days
+ 1 wk. 2 days

5.

20 min. 10 sec.
+ 12 min. 15 sec.

6.

9 lb. 7 oz.
+ 4 lb. 5 oz.

Architectural – Bell Ringer # 49

Solve the problems.

10.

52 yd.
+13 yd. 2 ft.

11.

12 hr. 25 min.
+ 6 hr. 25 min.

12.

8 T. 700 lb.
+ 12 T. 800 lb.

13. Kirk needs to replace the counter tops in a dental clinic. He needs one piece 2 ft. 8 in. long and a second piece 3 ft. 2 in. long. How much material does he need in all?

Answer _____

14. To paint the countertops, Kirk bought 2 gallons and 2 quarts of white paint. He mixed them with 1 gallon and 1 quart of blue paint. How much paint does he have in all?

Answer _____

BELL RINGERS 8-23

1st and 3rd period

1. When I grow up I want to be… Tell why
2. Describe different degrees and certifications in healthcare
3. Why is it important to have standards of care?
4. Why are support personnel necessary?
5. Identify 3 different healthcare careers and job functions of each

4th period

1. Subdermal, antiemetic, bradycardia
2. Histoma, buccal, histocyte
3. Postpartum, leukocyte, supracostal
4. Allergen, acrocyanosis, lipoid
5. Gastrostomy, hepatomegaly, nephrolith

5th period

1. What is the universal sign of choking?
2. Describe the signs of difficulty breathing
3. How do you stop bleeding?
4. What do you do for a shock victim?
5. What are some of the signs of heart attack?

6th period

1. Describe a eukaryotic cell.
2. Describe a prokaryotic cell.
3. Give the function for cell membrane, chromosome, cell wall, mitochondria
4. What are some of the benefits of understanding structure of cells?

5. What is the “Cell Theory”

Bell ringers Aug 16-20

1st and 3rd period. Healthcare Principles

1. Gice 3 people in history who made an important contribution to healthcare and what it was.
2. Explain how early beliefs about disease differed from current beliefs.
3. How does rising costs, managed care, technology and lifestyle affect the health care system?
4. How would the price of a hospital bill be different with different insurances?
5. What is the meaning and function of OBRA? What did it mean for healthcare?

4th period

Define the following

1. Gastritis, dermatitis, nephrectomy
2. Lipoid, nephrolith, angiomyoma
3. Supracostal, lithotripsy, allergen
4. Hematemesis, bradycardia, caudal
5. Rhinopathy, carditis, dermoplasty

5th period

1. Why is safety training so important?
2. When using a fire extinguisher, what are the steps?
3. Who should be called first in an emergency and why/
4. What makes up a first aid kit?
5. Describe the two different types of data that can be given?

6th period

1. What does Koch's Postulate say? Give an example
2. What are the two categories of microbes
3. How do microorganisms help us?
4. What is Pasteurization?

5. What is an infectious disease?

9-20-10 Intro Bellringers

9-20-10
State the difference between a living will and designation of healthcare surrogate.

9-21-10
What are the 3 parts of a contract and explain each

9-22-10
What is confidentiality

9-23-10
If a health care worker sends information to an insurance company without the patients consent this would be considered?

9-24-10
What is the difference between mitosis and meiosis?

Bellringers 9-13

1st and 3rd

1. How do professional organizations play a part in healthcare?
2. Describe the importance of teamwork in healthcare.
3. Why do people learn differently?
4. What makes a good leader?
5. If we did not have leadership in healthcare, what would be the outcome?

4th period

1. Why is it important to always spell medical terms correctly?
2. What are the three types of word parts?
3. What is a root word? Give an example.
4. What is a suffix? Give an example.
5. What is a prefix? Give an example.

5th period

1. What are the signs of a bad allergic reaction?
2. If you are trained, is it okay to inject the epipen to her?
3. If someone's ankle is swollen and discolored after a fall, what should you do?
4. A coworker burns his arm, what should you do?
5. You find out that a victim you helped has died and you feel troubled. What should you do?

6th period

1. What are cocci in pairs?
2. What are cocci in chains?
3. What are cocci in clusters
4. What bacteria causes strep throat?
5. What virus causes AIDS?

Bellringers 9-13

1st and 3rd

1. How do professional organizations play a part in healthcare?
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6th period

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3. What are cocci in clusters
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5. What virus causes AIDS?

Bellringers 10/18

1st and 3rd

1. Give meaning of:Hgb,HS,IDDM,I&O
2. Prn, TPR,VS,w/c,wt
3. IM,IV, LOC, NPO,OOB
4. SOB,O2, pc,qd
5. Qhs, r/o, SOB,tx,URI

4th

1. Define rrhagia, rrhexis,rrhapy
2. Define fascia,tendon,range of motion
3. What are the three types of muscles
4. What are the types of smooth muscle
5. What is kinesiology

6th

1.What is sterilization

2. what is disinfection

3. what is a thermophile,a mesophile, a psychrophile

4. what is desiccation

Bellringers week of Sept 20

1st and 3rd

1. What are ethics?
2. Define malpractice
3. Define negligence.
4. Define contract
5. What are privileged communications?

4th period

1. What is the vertical plane?What division of the body does it give?
2. What is the correct anatomic position?
3. What is the horizontal plane. What division of the body does it give?
4. Name the 2 parts of the dorsal cavity
5. Name the 3 parts of the ventral cavity

5th period

1. What are the signs of a head injury?
2. Why do you hold the head when you suspect a spine injury?
3. What are the first aid procedures for splinting
4. What are the first aid steps for a penetrating abdominal wound
5. What is the first aid procedures for controlling bleeding?

6th period

1. What is streptococcus?
2. What is staphylococcus?
3. What is a prion. Who does it infect.
4. What is a viroid. What does it infect.
5. Why do antibiotics not work on viruses

Bellringers INTRO
8-30-10----9-3-10

8-30-10
How do you obtain each of the following degrees:
Associates
Bachelors
Masters
Doctorate

8-31-10
What is the difference between a paramedic and an EMT?

9-1-10
Name 5 of the 7 clusters in the NHCSS and give two examples of each career

9-2-10
What are the initials for Medical Doctor, Chiropractor, and Respiratory Therapist

9-3-10
Choose 2 careers and explain the education required, possible employers, and duties of each career.

Daily Questions
CAD/CAM/CNC and Manual Programming (MTT 130 & MTT 132)

8/15/11

In terms of CNC, what is an ATC?

What is an MCU?

Why must a CNC use a ball screw in place of an acme lead screw?

8/16/11

What is a modal code?

What is another name for the Cartesian coordinate system?

8/17/11

What H-code must be used if one is using tool #7?

What D-code must one use if tool #12 is being programmed?

What is the minimum movement or distance allowed when calling or canceling cutter compensation (G41, G42 or G40)?

8/18/11

What is the character that ends each line of code? (You will need to look this up in section 8, unit 1.)

Explain the purpose of the safe start portion on a CNC code.

8/19/11

What are two advantages to a shrink fit tool holder?

8/22/11

What are a VMC and an HMC?

What is a tomb stone in CNC terms?

Explain how to use a step clamp correctly.

8/23/11

Explain G98 and G99

If a G01 line of code is called with no F code, what feed will the machine run?

8/24/11

The combination of the machining operations required to produce a part is called a manufacturing _____. (Page 634)

What is process planning?

What type of information can be found on a process plan? (Page 149)

8/25/11

Please write a small code to cut a one inch by one inch square one fourth of an inch thick no peeking at an old program.

8/26/11

Which coordinate system uses an angle and a distance to indentify a position?

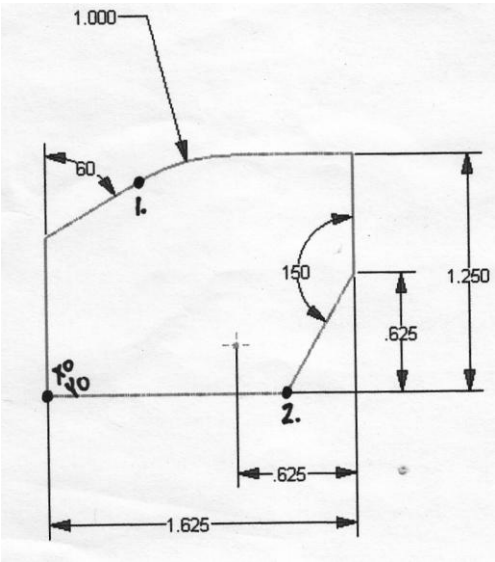
What is wrong with the following line of code:
G1 G41 X2.7798 Y2.9431

8/29/11

Please write a small code to cut a two inch by two inch square one fourth of an inch thick no peeking at an old program. Please put a ¼" chamfer on the bottom two corners and ¼: radii on the top to corners.

8/30/11

Please find the x and y locations for point 1 and 2 in relationship to x0y0.



8/31/11

Please make a sketch of the following part from its code:

```
%
O1235
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF 21)
M1
G0G90G54G43G17X-.5Y-.5Z1.H1S1500M3
Z.1
G1Z-.25F5.M8
G1G41X0D21
Y3.5
G2X.5Y4.R.5
G1X3.
X6.Y2.
Y0
X-.2
G1G40X-.5Y-.5
Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/1/11

Please make a sketch of the following part from its code:

```
%
O1236
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF21)
M1
G0G90G54G43G17X0Y0Z1.H1S1500M3
Z.1
G98G83Z-.25R.1Q.05F20.
X1.Y1.
X-1.
G80
X-2.5Y0
G1Z-.25F20.
G1G41X-2.125D21
G2X-2.125Y0I2.125J0
G1G40X-2.5
G0Z.1
X1.Y-1.
G1Z-.25
G2X0Y-1.4142R1.4142
G2X-1Y-1.R1.4142
G0Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/2/11

You may use the internet for the following questions:

What is SkillsUSA?

What is the SkillsUSA Creed?

9/6/11

What type of word would be used for setting a CNC machines feed?

What type of word would be used to setting a CNC machines speed?

9/7/11

What does the “M” in m-code stand for?

9/8/11

What type of motor is used in most CNC axis drive applications?

9/9/11

What is connected to the servo of a CNC machine that tells it how far it has moved or how far it has moved?

9/12/11

What RPM would one run a 3/4” 4 flute end mill if machining brass? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/13/11

What RPM would one run a 2.5” 6 flute face mill if machining Die Steel? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/14/11

What is the volume in Lbs/in^3 of a 6” diameter by 4’ bar of 1018 CRS?

What would it weight in pounds at a density of .284 lb/in^3?

How much would it cost at $2.00 per pound?

9/15/11

How much would a 2” diameter by 12” long bar of 4140 cost if its density is .284 lb/in³ at $3.22 per pound?

9/16/11

How much would a 2” by 2” by 5” bar of gold cost if its density is .682 lb/in³ at $1,880.00 per oz.?

9/19/11

Please program a Ø5” circle using I’s and J’s with X0 Y0 in the center of the circle.

9/20/11

What RPM would one run a 1” 4 flute end mill if machining Die Steel? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/21/11

Please measure the bronze bushing as it comes around the room and calculate the weight.

9/22/11

If Blake’s head was cylidrical shaped and it measured 9” in diameter and from top to chin was 11” long, how many cubic inches of brains would fit in it?

9/23/11

What is G54? (Explain your answer)

9/26/11

Why is it important to process plan a part?

9/27/11

What is the largest diameter tool that can be used to machine an interior radius of 5/8”?

What is the largest hex that may be machined from a 2” diameter round bar?

9/28/11

What is an apprenticeship?

9/29/11

Atlas fieldtrip!

10/10/11

When drawing a circle in MasterCAM, does one put in the radius or the diameter?

10/11/11

Please write the decimal equivalents for all odd 8^{th} and 16^{th} fractions.

10/12/11

What should be done to insure that a line is vertical when creating it in MasterCAM?

What is the difference between a view plane and a construction plane?

10/13/11

What is a Tool Plane?

How can the selection of a tool plane affect the part program?

10/14/11

What is the tap drill size for a 3/4 - 10 UNC 3B nut? (use a calculator only)

What should the feed rate be if rigid tapping on a CNC milling machine at an RPM of 200 for a 3/8- 16 UNC tap?

10/17/11

What toolpath would be best to cut just the profile of a part when using MasterCAM?

What toolpath would be best to cut a rectangular hole into a part when using MasterCAM?

10/18/11

What is the difference between stock origin and part origin?

10/19/11

What does the term tangent mean?

10/20/11

Without a calculator, what is one half of 7/16, 15/16, 7/8 and 11/32?

10/21/11

When trimming, what would cause the opposite side of the line you want to disappear?

10/24/11

At what RPM & Feed in IPM would one run a 7/16” 4-flute Carbide end mill in die steel?

10/25/11

If one were running an RPM of 1700 with a ¾" 4-flute end mill what would be the SFM?

10/26/11

If one were running an RPM of 3500 with a ¾" 2-flute insert cutter what would be the SFM?

If the above mentioned cutter is running at 18 Inches per minute what would the chip load be?

10/27/11

What does SFM stand for?

What is SFM?

Why is it important to know how to calculate SFM?

10/28/11

How long would it take to cut 4 cuts around a 4" by 4" square block at a feed rate 6 inches per minute running and RPM of 700?

10/31/11

Happy Halloween!

Please calculate the RPM and correct feed rate in inches per minute for the following materials and tools. Use the chart that I gave you for the cutting speeds. Use the lowest available cutting speed and chip load for each material.

1. 1" Carbide 4-flute End Mill machining Die Steel

   SFM _____
   Chip Load _____
   RPM _____
   Feed _____

2. 3/4" HSS 2-flute End Mill machining an Aluminum Alloy
   SFM _____
   Chip Load _____
   RPM _____
   Feed _____

11/1/11

Please calculate the surface feet per minute, chip load, and IPR for the given tools below.

1. 9/16” 2-flute end mill running 1950 RPM and a feed of 2.5 IPM
   SFM _____
   Chip Load _____
   IPR _____

2. 7/8” 4-flute end mill running 650 RPM and a feed of 4.0 IPM
   SFM _____
   Chip Load _____
   IPR _____

11/2/11

Which metal removal variable has the greatest affect on tool life?

Feed rates for milling operations are expressed as _____.

11/3/11

A CNC milling machine uses a feed rate given in inches per revolution (IPR). What is the feed in inches per revolution for a four fluted end mill with a recommended chip load per tooth of 0.014 inches?

How long would it take to cut 6 cuts around a 5” by 7” rectangular block at a feed rate 5 inches per minute running and RPM of 900?

11/4/11

List what you think are the 5 most important safety rules in the manual or CNC shop.

11/9/11

What are a VMC and an HMC?

What is a tomb stone in CNC terms?

Draw a sketch showing how to use a step clamp correctly.

11/10/11

What is wrong with the following line of code that is used to call cutter comp:
G1 X2.7798 Y2.9431 D21

11/11/11

Define surface feet per minute.

11/14/11

List information that should be found on a résumé?

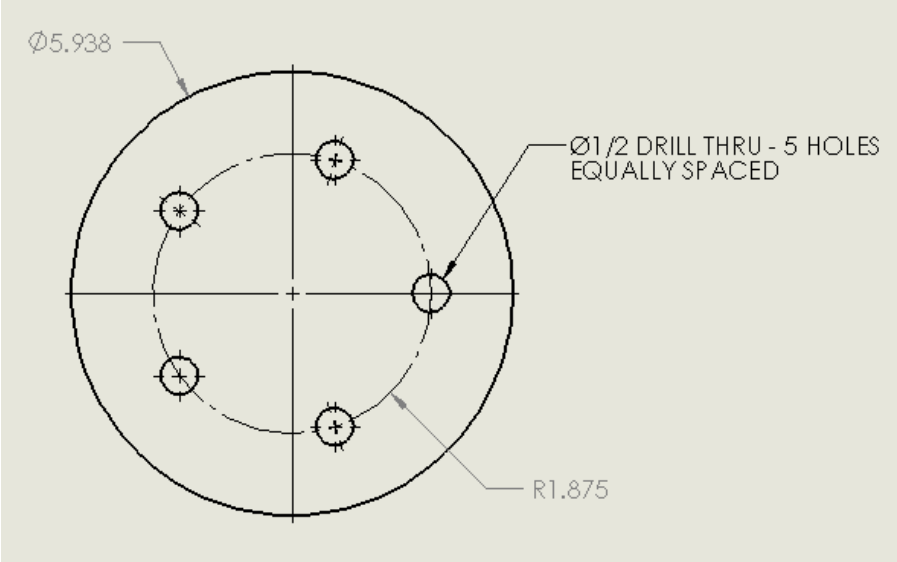
11/15/11

What is the largest square that may be machined from a 10” round plate?

Kenny was removing a cutter from its holder. His hand slipped a d his finger came in contact with the cutting edge. We cleaned the wound and covered with a bandage.

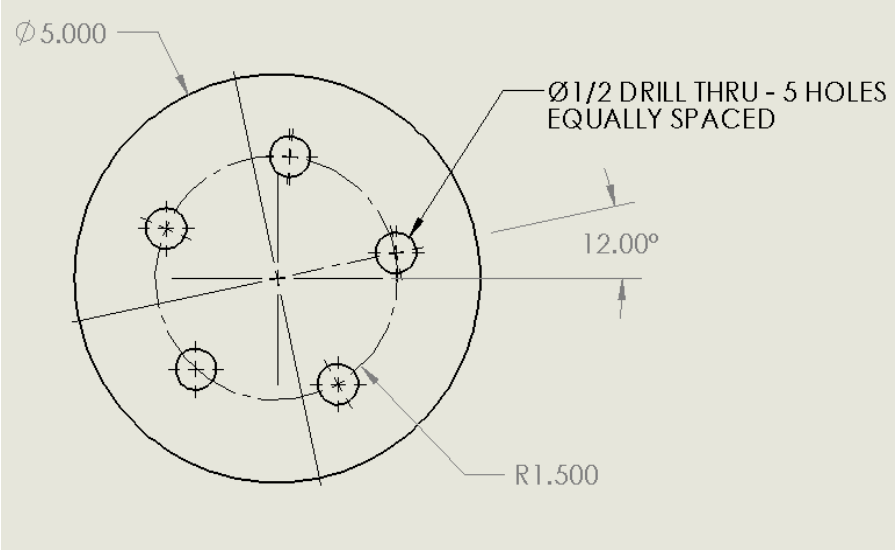
11/16/11

Please calculate the X and Y locations for each hole below. The origin is located in the center of the Ø5.938 part. Start at the right hole at 0°. Work your way around the part in a counter clockwise motion.



11/17/11

Please calculate the X and Y locations for each hole below. The origin is located in the center of the Ø5.938 part. Start at the right hole at 12°. Work your way around the part in a counter clockwise motion.

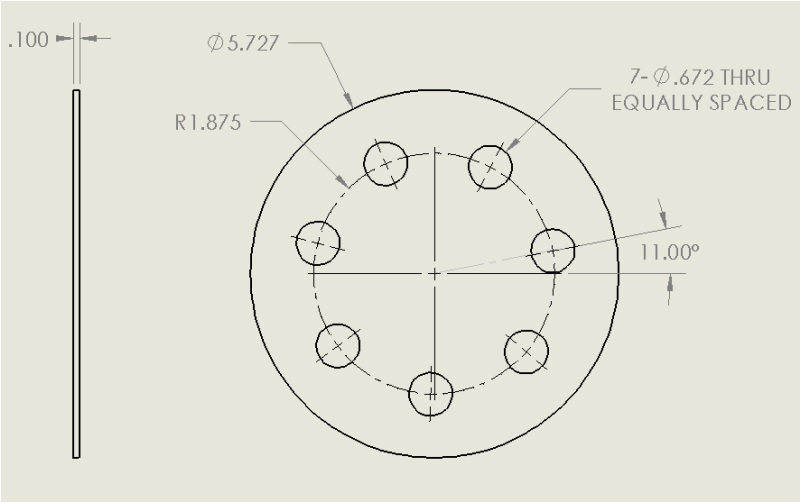


11/18/11

No Question! Fieldtrip to Whitworth Tool and Stamping.

11/21/11

Please calculate the X and Y locations for each hole below. The origin is located in the center of the Ø5.727 part. Start at the right hole at 11°. Work your way around the part in a counter clockwise motion.



11/22/11

No question! Happy Thanksgiving! Gobble! Gobble!

11/28/11

How far apart are the holes, in degrees, on a 11" diameter BHC with 9 holes equally spaced?

11/29/11

What would be the x and y location for the second hole, going counter clockwise, on a 15" diameter, 5 hole BHC. If the start hole (hole closest to 0°) is 8° from 0°?

11/30/11

What types of shank are on the tool holders for the Leadwell Machining Center (Big Green)?

How much would a 5" diameter by 3 foot long bar of 4140 cost if its density is .284 lb/in³ at $3.22 per pound?

12/1/11

Please write the definitions of the following G-codes:
G54
G00
G17
G01
G02
G03
G81
G83
G41
G42
G80
G40

12/2/11

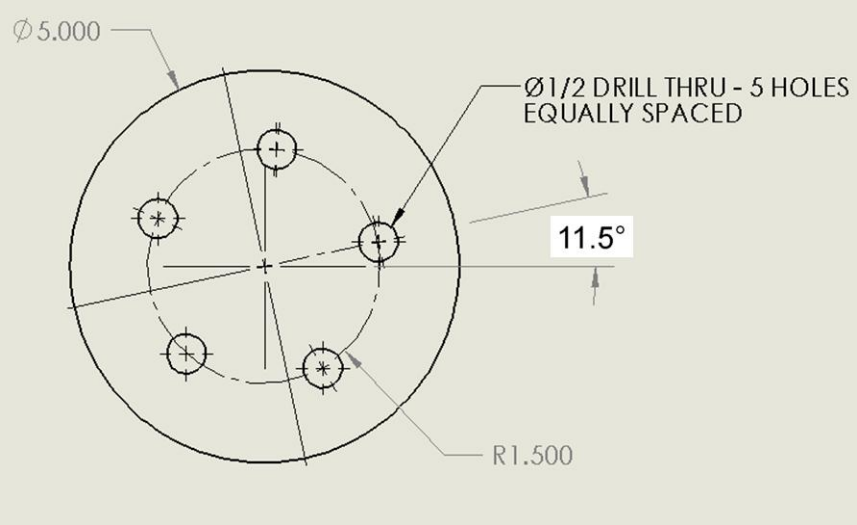
What piece of a CNC milling machine lets you machine without the effects of backlash?

What is the part that screws into the back of the tool holders for the Leadwell Machining Center? (This part is used to hold the tool holder in the spindle.)

What is the name of the motor that is used to drive the various axis of most CNC equipment?

12/5/11

Please calculate the X and Y locations for each hole below. The origin is located in the center of the Ø5.938 part. Start at the right hole at 11.5°. Work your way around the part in a counter clockwise motion.



12/6/11

Please write a short program to machine a 4” by 4” block. Must be 1/4" thick with a 5/16-18 tapped holes at .75” from each corner. Call cutter comp for outside profile and spot drill, drill, c-sink, & tap with canned cycles.

12/7/11

What would a 5” diameter bar of steel weight if it were cut 6’ long? The density of steel is .2833 in^3.

12/8/11

What feed rate, in IPM, should a 3/8-16 UNC tap feed if running 250 RPM?

12/9/11

Please write a peck drilling cycle for one hole at X0 Y0. It should be for a 9/16” diameter drill machining A-2 tool steel. Please calculate the RPM and feed rate as well. Start your code at the tool change line and end at canned cycle cancel.

12/12/11

What are a VMC and an HMC?

What is a tomb stone in CNC terms?

Explain how to use a step clamp correctly.

12/13/11

Explain G98 and G99

If a G01 line of code is called with no F code, what feed will the machine run?

12/14/11 to 1/4/12

No Question! Merry Christmas!

1/4/2012

Define:
Mean
Median
Mode
Range

1/5/2012

What are the mean, median, mode, and range of the following data set?
88,71,90,99,14,22,11,17,14,55, 21

1/6/2012

What are the three most common axes on a CNC machining center?

What are the two most common axes on a CNC turning center?

What is the difference between a CNC lathe and a Turning Center?

1/9/12

What is an encoder and where is it normally located on a CNC machining center?

1/10/12

What does the X-axis usually represent on a CNC turning center or CNC lathe?

1/11/12

What is a sub-routine in CNC terms?

1/12/12

What are the groups of terms referred to in an NC code such as “F12.7” or “X11.625”?

1/13/12

What should the feed rate be on a 5/16-18 UNC tap at an RPM of 250? (Assume a 100% feed rate is needed)

1/17/12

When programming a CNC lathe, one may use T0101 or T070707. Please explain what this part of the code is and what each portion of it represents.

1/18/12

If a first run CNC lathe part on a proven program is .007 too large on all diameters, what should be done to bring it into tolerance?

1/19/12

What should be your main goal when making any product?

1/20/12

What is the pitch on a 5/16-18 UNC 3B thread?

Is this a nut or bolt?

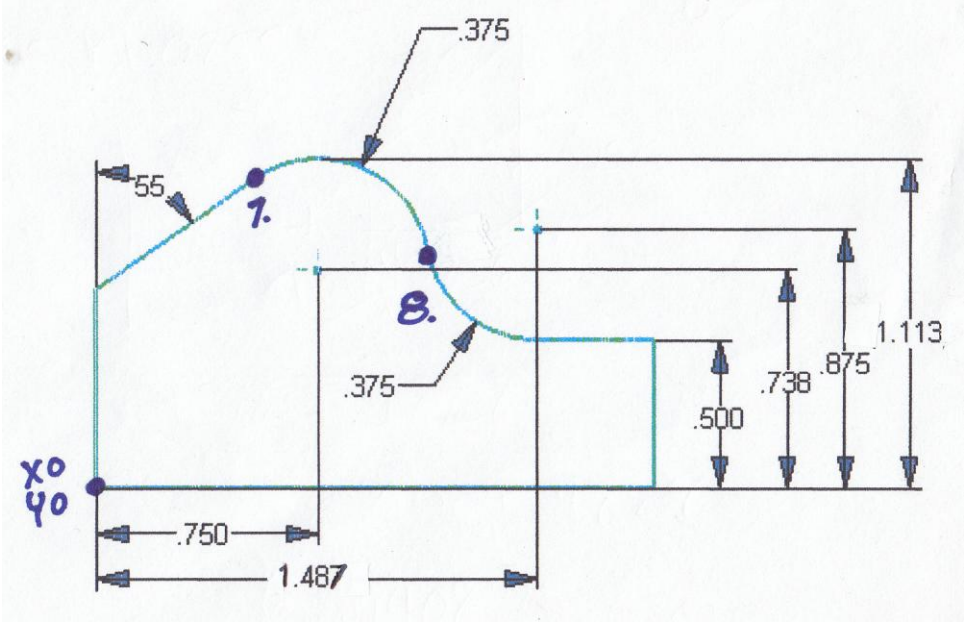
What is its major diameter?

Is it coarse or fine?

Is it a loose fit tolerance or a close fit?

1/23/12

Please solve for points 7 & 8. The bottom left corner of the part is the origin.



1/24/12

What is the name of the switch that needed adjustment on the Okuma lathe in order for the chuck to recognize that it was closed? (This is the same type of switch or sensor that the big mill uses to know where the spindle is during orientation for a tool change)

1/25/12

Explain how a turning center with a sub-spindle can increase productivity.

1/26/12

What is the difference between a bar puller and a bar feeder?

1/27/12

What does the term live tooling mean?

1/30/12

Work Keys questions:

1. You are preparing to tile the floor of a rectangular room that is 15½ feet by 18½ feet in size. The tiles you plan to use are square, measuring 12 inches on each side, and are sold in boxes that contain enough tile to cover 25 square feet. How many boxes of tiles must you order to complete the job?

2. In your job as a cashier, a customer gives you a $20 bill to pay for a can of coffee that costs $3.84. How much change should you give back?

1/31/12

1. Quik Call charges 18¢ per minute for long-distance calls. Econo Phone totals your phone usage each month and rounds the number of minutes up to the nearest 15 minutes. It then charges $7.90 per hour of phone usage, dividing this charge into 15-minute segments if you used less than a full hour. If your office makes 5 hours 3 minutes worth of calls this month using the company with the lower price, how much will these calls cost?

1. $39.50
2. $41.48
3. $41.87
4. $54.00
5. $54.54

2. Over the last 5 days, you made the following numbers of sales calls: 8, 7, 9, 5, and 7. On the average, how many calls did you make each day?

1. 5.8
2. 7.0
3. 7.2
4. 9.0
5. 36.0

2/1/12

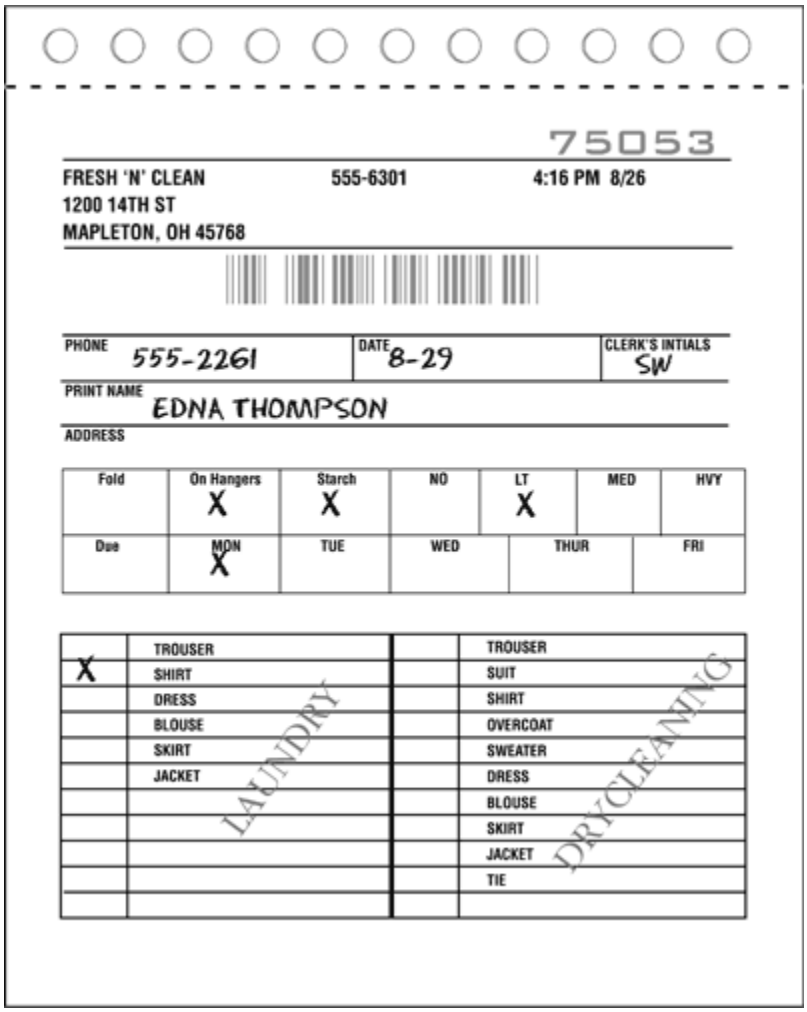
The industry where you just started working has a vertical cylindrical oil tank that is 2.5 feet across on the inside. The depth of the oil in the tank is 2 feet. If 1 cubic foot of space holds 7.48 gallons, about how many gallons of oil are left in the tank?

1. 37
2. 59
3. 73
4. 230
5. 294

You regularly check the pressure gauge on a large tank. According to the gauge shown, what is the current pressure (in PSI)?

1. 30
2. 35
3. 40
4. 45
5. 100

2/2/12



75053

FRESH 'N' CLEAN 555-6301 4:16 PM 8/26
1200 14TH ST
MAPLETON, OH 45768

PHONE	DATE	CLERK'S INTIALS
555-2261	8-29	SW

PRINT NAME EDNA THOMPSON
ADDRESS

Fold	On Hangers	Starch	NO	LT	MED	HVY
	X	X		X		

Due	MON	TUE	WED	THUR	FRI
	X				

LAUNDRY

X	TROUSER
	SHIRT
	DRESS
	BLOUSE
	SKIRT
	JACKET

DRYCLEANING

	TROUSER
	SUIT
	SHIRT
	OVERCOAT
	SWEATER
	DRESS
	BLOUSE
	SKIRT
	JACKET
	TIE

You must sort clothes in a dry cleaning establishment according to the customer's instructions. According to the form shown, how should this customer's shirt be treated?

1. Dryclean it, add light starch, and fold it.
2. Dryclean it, add light starch, and place it on a hanger.
3. Launder it with no starch and place it on a hanger.
4. Launder it with light starch and place it on a hanger.
5. Launder it with medium starch and fold it.

ATTENTION CASHIERS:

All store employees will now get 20% off the price of clothes they buy here. Please follow the new directions listed below.

<u>Selling clothes to employees</u>

- Ask to see the employee's store identification card.

- Enter the employee's department code number into the cash register.
- Use the cash register to take 20% off the price. Then push the sales tax button.
- Write your initials on the sales receipt.
- Sell clothes to employees during store hours only.

Accepting clothing returns from employees

- Employees receive a store credit certificate for clothes they return to the store.
- Store credit certificates are next to the gift certificates.
- Employees may not get a cash refund for clothes they return to the store.

You are a cashier. According to the notice shown, what should you write on a store employee's receipt?

A. The employee's identification number
B. The employee's department number
C. The amount of sales tax
D. The 20% discount price
E. Your initials

2/3/12

INSTRUCTIONS TO SORTING DEPARTMENT:
SPECIAL PROJECT TO FIX ORDER #888

Five long, blue plastic bins have been placed over by the overhead door. Piled on the other side of this room, near the time clock, are several thousand steel rods of varying lengths. All of those rods must be sorted by length and placed in the bins.

Bin "1" is for rods that are four to five meters long.

Bin "2" is for rods that have a length of over five meters, up to six meters.

Bin "3" is for rods that have a length of over six meters, up to eight meters.

Bin "4" is for rods that have a length of over eight meters, up to ten meters.

Bin "5" is for warped or unsmoothed rods. These will not be accepted.

If these rods are not all sorted correctly, the customer will reject the order. We cannot afford to let that happen again. Work as quickly as you can because Friday is the deadline for delivery of the order.

According to the instructions shown, what is a condition for project success other than delivery on time?

A. All rods must be sorted by both length and diameter.
B. Rods eleven meters long must be leaned against the overhead door.
C. The customer does not want rods that are warped.
D. The five-meter-long rods must go in Bin 2.

2/6/12

ATTENTION CASHIERS:

All store employees will now get 20% off the price of clothes they buy here. Please follow the new directions listed below.

Selling clothes to employees

- Ask to see the employee's store identification card.
- Enter the employee's department code number into the cash register.
- Use the cash register to take 20% off the price. Then push the sales tax button.
- Write your initials on the sales receipt.
- Sell clothes to employees during store hours only.

Accepting clothing returns from employees

- Employees receive a store credit certificate for clothes they return to the store.
- Store credit certificates are next to the gift certificates.
- Employees may not get a cash refund for clothes they return to the store.

You are a cashier. According to the notice shown, what should you write on a store employee's receipt?

F. The employee's identification number
G. The employee's department number
H. The amount of sales tax
I. The 20% discount price
J. Your initials

It is your job to clean and maintain the fish tank in a dentist's office. The tank is 4 feet long and 2 feet wide. The water in it is about 2 feet deep. To treat the water in the tank, you need to add 1 teaspoon of disinfecting solution for every 10 gallons of water. About how many teaspoons of the solution will you need to add to the tank?

A. $\frac{1}{2}$
B. $1\frac{1}{2}$
C. 12
D. 31
E. 120

2/7/12

You design and build furniture, and you have agreed to build a bookcase for a customer. Using a materials list, you determine that you need 4 boards 1 inch by 8 inches by 6 feet and 3 boards 1 inch by 6 inches by 4 feet. These boards are priced at $1.25 per board foot. In addition, you will need 3 packages of screws at $0.79 each and one can of varnish at $3.75. Sales tax is 6%. What will be the total cost of all the materials for the bookcase, including tax?

A. $33.62
B. $33.96
C. $35.64
D. $41.91
E. $54.19

2/8/12

You have a 30-amp power strip with four outlets. The power source is 110 volts. Based on the information shown, which of the following combinations of devices could you use on this power strip?

Worklight	150 watts
½" Drill	605 watts
Orbital Sander	880 watts
Bench Grinder	1100 watts
Drill Press	1320 watts

A. Drill press, bench grinder, orbital sander, ½ " drill
B. Drill press, bench grinder, orbital sander, worklight
C. Drill press, orbital sander, two ½ " drills
D. Drill press, orbital sander, ½ " drill, worklight
E. Bench grinder, orbital sander, two ½ " drills, worklight

2/9/12

You plan to attend night school in 3 months so you can qualify for a promotion at work. You need to earn an additional $1,140 for tuition within that time. You take a second job, which pays $8 per hour. The work schedule is flexible, and you can work as many hours as you want. Taxes take 15% of your wages and you save the rest. Over the next 3 months, what is the minimum number of hours you could work each month to earn the money for tuition?

A. 14
B. 48
C. 56
D. 84
E. 168

2/10/12

You work for a landscaper that has a customer needing to seed an area of land 80 feet by 40 feet in size. The garden center has 5-pound bags of grass seed. Each bag of seed can cover 25 square yards of land. Based on your calculations, how many bags of grass seed do you need to cover the lot?

A. 14
B. 15
C. 25
D. 43
E. 128

2/13/12

The Zippy Lube business where you work printed coupons offering $8.00 off any oil change this month. An oil change costs $19.95 and a new oil filter costs $4.95. A customer comes in with a coupon and has you change the oil and filter. Before adding the tax, how much should you charge the customer?

A. $11.95
B. $16.90
C. $24.90
D. $27.95
E. $32.90

2/14/12

Memorandum

TO: All Production Employees
FROM: John Logan, Production Manager
SUBJECT: New Tool Policy

We will be changing from the 5-piece tool kits you each have to a standard set of all 8 tools. Each employee will no longer have a set of tools. Instead, one new tool set will be placed in each workstation's toolbox.

The new tool sets will be put at each station on the 3rd of next month. You must turn in the old tool kit that you have been using to the tool room at that time. You must pay for any tools missing from your tool kit when you turn it in.

You must report any missing tools from the new tool set. Get replacements if necessary. Tools will be sharpened four times a month by maintenance. At other times, take dull tools to the tool room and exchange them for new ones.

1. According to the memo shown, who must report any missing tools?

A. Maintenance employees
B. Production employees
C. The production manager
D. The tool room supervisor
E. The workstation manager

2/15/12

Chadwick Senior High School
Fire Drill Schedule Notice

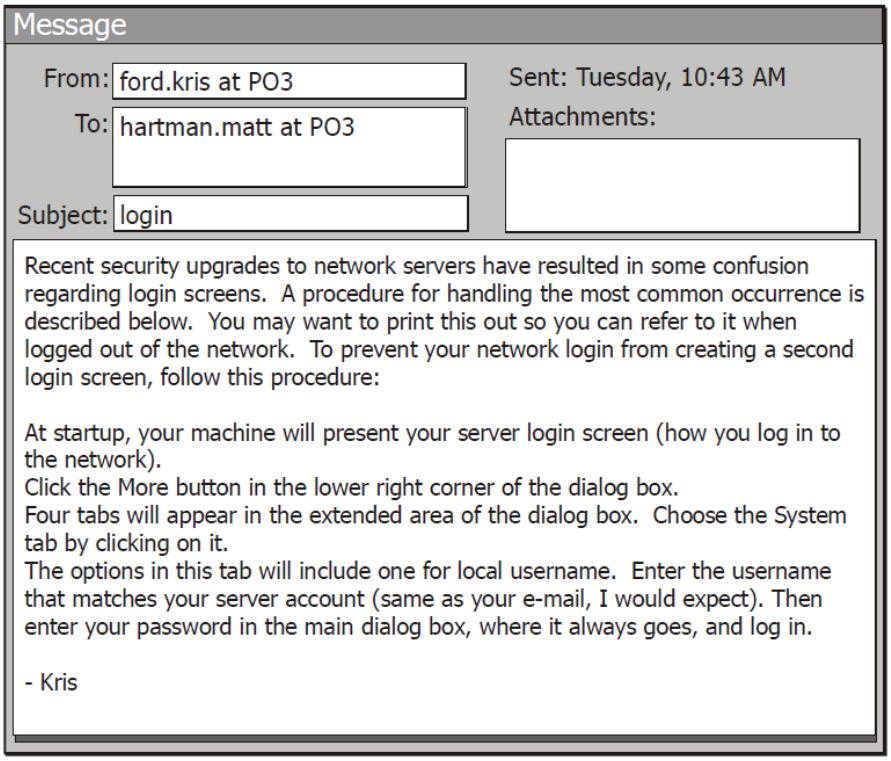
After the occurrence of a fire drill on any regular school day, there will be schedule changes to allow the school day to end at its normal time of 3:00 p.m. Fire drills normally last a duration of 15-20 minutes. The period in which the fire drill began is considered finished at the end of the fire drill. When the fire drill is over, an announcement will be made over the P.A. system informing all faculty, staff, and students what period is about to commence, so everyone knows where he or she is supposed to be.

If the fire drill takes place during period 1, then all subsequent periods are 42 minutes long, rather than 45, and bells will ring accordingly. If the fire drill takes place any time during periods 2 through 6, then all subsequent periods will be 40 minutes long and bells will ring accordingly. If the fire drill takes place during the second to last period (7), then the last period (8) will be 38 minutes long and bells will ring accordingly.

1. You are a teacher's assistant at Chadwick Senior High School. According to the notice shown, if a fire drill takes place during period 1, each of the remaining periods will last:

A. 20 minutes.
B. 38 minutes.
C. 40 minutes.
D. 42 minutes.
E. 45 minutes.

2/16/12



Message

From: ford.kris at PO3

To: hartman.matt at PO3

Sent: Tuesday, 10:43 AM

Attachments:

Subject: login

Recent security upgrades to network servers have resulted in some confusion regarding login screens. A procedure for handling the most common occurrence is described below. You may want to print this out so you can refer to it when logged out of the network. To prevent your network login from creating a second login screen, follow this procedure:

At startup, your machine will present your server login screen (how you log in to the network).
Click the More button in the lower right corner of the dialog box.
Four tabs will appear in the extended area of the dialog box. Choose the System tab by clicking on it.
The options in this tab will include one for local username. Enter the username that matches your server account (same as your e-mail, I would expect). Then enter your password in the main dialog box, where it always goes, and log in.

- Kris

If you follow the steps of this procedure, what situation will you correct?

A. Being logged out of the network
B. Having a second login screen appear
C. Having to enter a password
D. Logging into an unmatched server account
E. Receiving unnecessary attachments

2/21/12

What should the pitch diameter measure on a 7/8-14 Unified National Thread?

If a thread that has been run on a turning center has a pitch diameter larger than needed, what should be done to get it to be on size? (still in the machine)

2/22/12

Find the smallest and largest wire size that can be used for the given thread. Use the smallest <u>available</u> wires and find the measurement over those wires for the given thread. And find the double depth of each thread.

Available wires:

.185	**.270**
.063	**.081**
.032	**.072**
.018	**.024**
.029	**.040**
.055	**.045**
.092	**.108**
.143	**.120**

1/2 - 13 UNC 3A
Smallest _____
Largest _____
Measurement over wires _____
Double Depth of thread _____

2/23/12

Find the smallest and largest wire size that can be used for the given thread. Use the smallest <u>available</u> wires and find the measurement over those wires for the given thread. And find the double depth of each thread.

Available wires:

.185	**.270**
.063	**.081**
.032	**.072**
.018	**.024**
.029	**.040**
.055	**.045**
.092	**.108**
.143	**.120**

1 1/2 - 6 UNC 3A
Smallest _____
Largest _____
Wires used to calculate M _____
Measurement over wires _____
Double Depth of thread _____

2/24/12

What are the three formulas used to calculate the measurement over wires for the three wire method?

2/27/12

Find the smallest and largest wire size that can be used for the given thread. Use the smallest <u>available</u> wires and find the upper and lower measurement over those wires for the given thread. Also find the double depth of each thread.

Available wires:

.185	**.270**
.063	**.081**
.032	**.072**
.018	**.024**
.029	**.040**
.055	**.045**
.092	**.108**
.143	**.120**

1 3/8-12 UNF 1A
Smallest _____
Largest _____
Wires used to calculate M _____
Measurement over wires Upper Limit _____
Lower Limit _____
Double Depth of thread _____
About how far would the compound rest be moved in at 29.5° for this thread?_____

2/28/12

Please write the formulas for the following thread calculations:

1. The smallest wire that may be used for three wire calculation _____

2. The largest wire that may be used for three wire calculation _____

3. The three wire formula for 3A threads when the pitch diameter is **<u>NOT</u>** known _____

4. The three wire formula when the pitch diameter is known _____

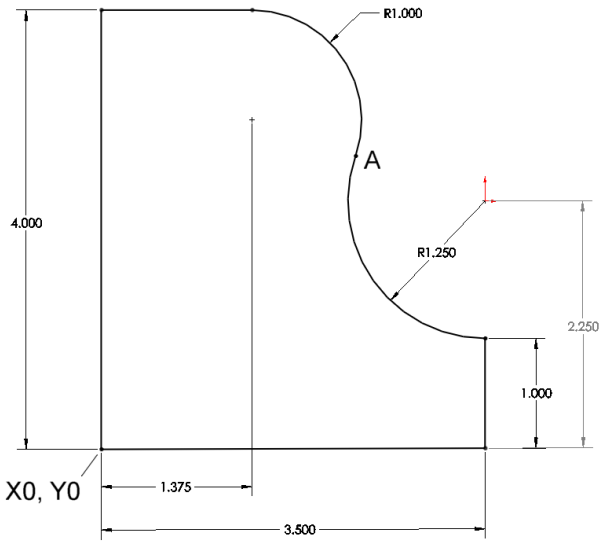
5. Compound movement amount at 29.5° when cutting a Unified National Thread _____

6. Formula for Double Depth of thread _____

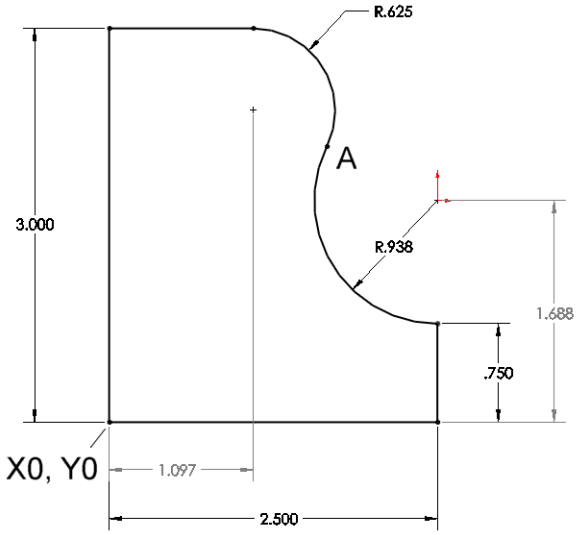
2/29/12

Work Keys Review

3/1/12 Please find the X & Y location for point “A”. The part origin is at the bottom left corner.

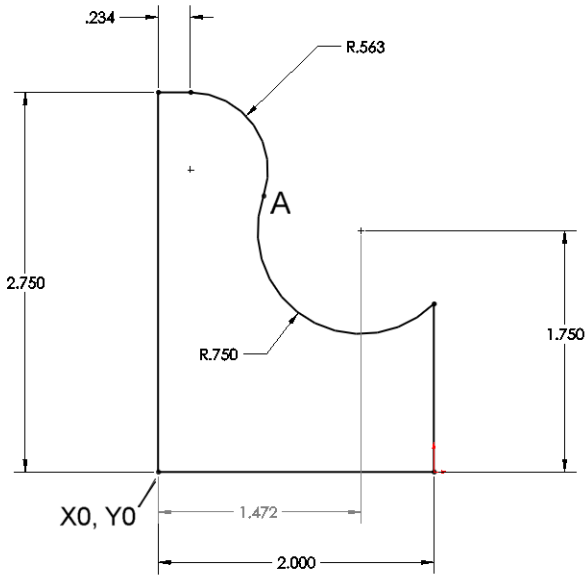


3/2/12 Please find the X & Y location for point “A”. The part origin is at the bottom left corner.



.

3/5/12 Please find the X & Y location for point “A”. The part origin is at the bottom left corner.



3/6/12

ACT testing! No question!

3/7/12

Please write the formulas for the following thread calculations:

1. The smallest wire that may be used for three wire calculation _____

2. The largest wire that may be used for three wire calculation _____

3. The three wire formula for 3A threads when the pitch diameter is NOT known _____

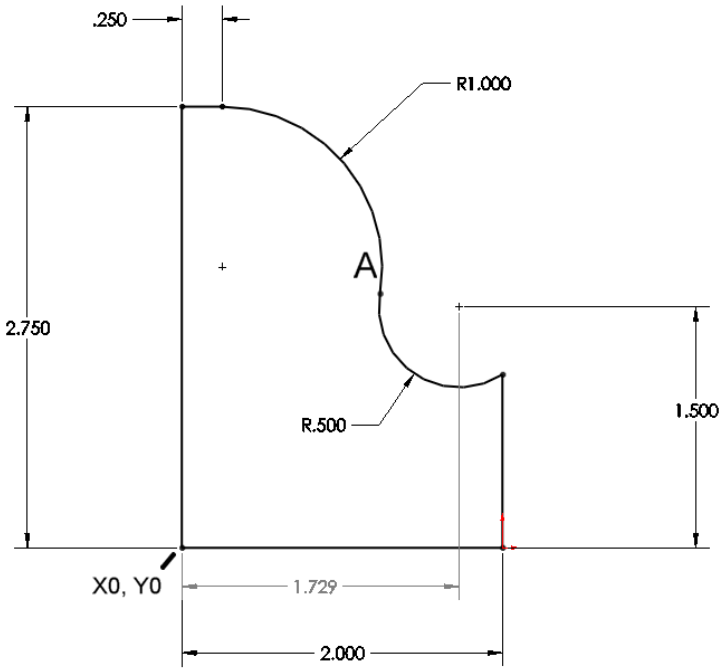
4. The three wire formula when the pitch diameter is known _____

5. Compound movement amount at 29.5° when cutting a Unified National Thread _____

6. Formula for Double Depth of thread _____

3/8/12

Please find the X & Y location for point “A”. The part origin is at the bottom left corner.



3/9/12

What exactly does the g-code G96 do? Explain your answer.

3/12/12

What is the pitch diameter limits for a 3/8-16 UNC 3A thread?

3/13/12

Compare a slant bed lathe to a general purpose late?

3/14/12

Please construct a mini process plan for the USB pen drive.

3/15/12

What is live tooling?

What is the advantage to this type of tooling?

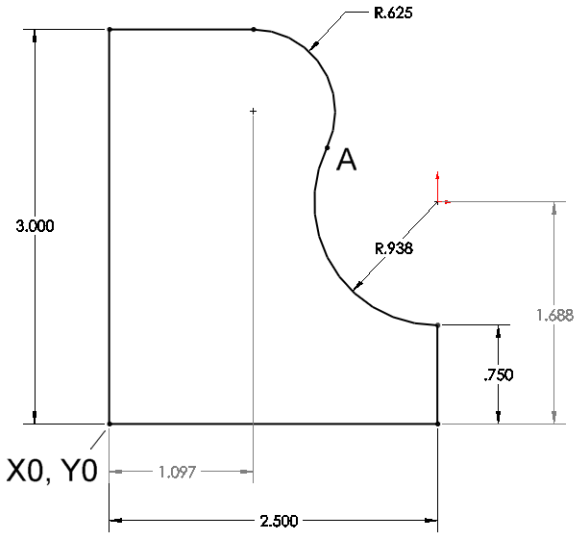
3/16/12

What is the name of the coordinate system that all machine tools are base from?

3/19/12

Test Tomorrow!

Please find the X & Y location for point “A”. The part origin is at the bottom left corner.



3/20/12

No Question! Test Today!

3/21/12

Using the Machinery’s Handbook, what do the following abbreviations stand for? (Look under fits)

RC
LC
LT
LN
FN

3/22/12

Please calculate the high and low limits for an Ø.750 shaft with an RC2 class of fit.

3/23/12

Please calculate the high and low limits for an Ø.500 hole with an FN2 class of fit.

Please calculate the high and low limits for an Ø.500 shaft with an FN2 class of fit.

What is the interference between the shaft at its highest limit and the hole at its lowers limit for the above mentioned parts?

3/26/12

What does the LC represent when discussing fits and tolerances?

What is the upper limit on a Ø3" shaft with an LC3 fit and an h7 tolerance?

What is the lower limit on a Ø3" hole with an LC3 fit and an H8 tolerance?

3/27/12

What is the purpose of a process plan or part routing?

3/28/12

What does ANSI stand for and why is it important?

3/29/12

No Question! Fits Test! Have a happy spring break!

Using the Machinery's Handbook, what do the following abbreviations stand for? (Look under fits)

1. *RC*
2. *LC*
3. *LT*
4. *LN*
5. *FN*

6. What is the upper limit on a Ø2" shaft with an LC3 fit?

7. What is the lower limit on a Ø2" hole with an LC3 fit?

8. What is the amount of interference if the above hole is at its smallest and the shaft is at its largest?

9. What is the upper limit on a Ø.75" shaft with an RC3 fit?

10. What is the lower limit on a Ø.75" hole with an RC3 fit?

11. What is the amount of clearance if the above hole is at its largest and the shaft is at its smallest?

4/9/12 Review Questions for the next two weeks:

Which coordinate system uses an angle and a distance to indentify a position?

What is wrong with the following line of code:
G1 G41 X2.7798 Y2.9431

4/10/12

What is connected to the servo of a CNC machine that tells it how far it has to move or how far it has moved?

4/11/12

Please program an Ø3" circle using I's and J's with X0 Y0 in the center of the circle.

4/12/12

What is a shrink fit tool holder?

4/13/12

What does NC stand for?

What does CNC stand for?

What is the difference between NC and CNC?

4/16/12

Please write a small code to cut a two inch by two inch square one fourth of an inch thick no peeking at an old program. Please put a ¼" chamfer on the bottom two corners and ¼: radii on the top two corners.

4/17/12

What is the sine of 45°?

What is the pitch diameter limits for a 3/8-16 UNC 3A thread?

4/18/12

What is the pitch on a 5/16-18 UNC 3B thread?

Is this a nut or bolt?

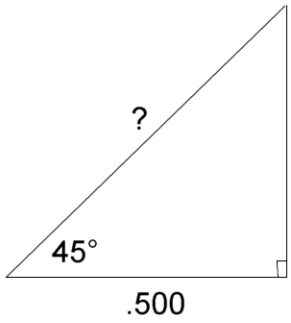
What is its major diameter?

Is it coarse or fine?

Is it a loose fit tolerance or a close fit?

4/19/12

Without using a calculator or Machinery's handbook, solve for the hypotenuse of the following right triangle.



4/20/12

What is the character that ends each line of code?

Daily Questions
CAD/CAM/CNC and Manual Programming (MTT 130 & MTT 132)

8/15/11

In terms of CNC, what is an ATC?

What is an MCU?

Why must a CNC use a ball screw in place of a acme lead screw?

8/16/11

What is a modal code?

What is another name for the Cartesian coordinate system?

8/17/11

What H-code must be used if one is using tool #7?

What D-code must one use if tool #12 is being programmed?

What is the minimum movement or distance allowed when calling or canceling cutter compensation (G41, G42 or G40)?

8/18/11

What is the character that ends each line of code? (You will need to look this up in section 8, unit 1.)

Explain the purpose of the safe start portion on a CNC code.

8/19/11

What are two advantages to a shrink fit tool holder?

8/22/11

What are a VMC and an HMC?

What is a tomb stone in CNC terms?

Explain how to use a step clamp correctly.

8/23/11

Explain G98 and G99

If a G01 line of code is called with no F code, what feed will the machine run?

8/24/11

The combination of the machining operations required to produce a part is called a manufacturing _____. (Page 634)

What is process planning?

What type of information can be found on a process plan? (Page 149)

8/25/11

Please write a small code to cut a one inch by one inch square one fourth of an inch thick no peeking at an old program.

8/26/11

Which coordinate system uses an angle and a distance to indentify a position?

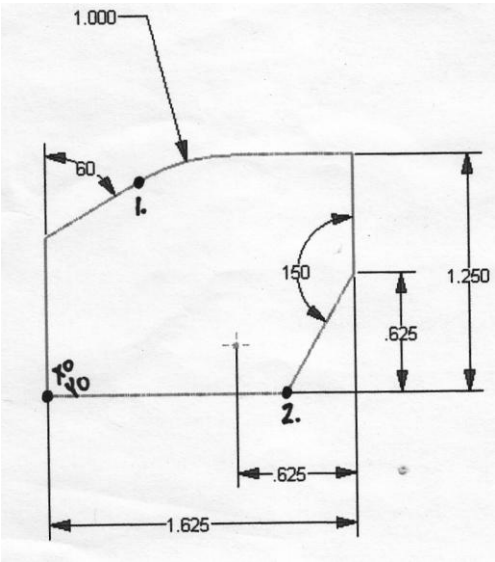
What is wrong with the following line of code:
G1 G41 X2.7798 Y2.9431

8/29/11

Please write a small code to cut a two inch by two inch square one fourth of an inch thick no peeking at an old program. Please put a ¼" chamfer on the bottom two corners and ¼: radii on the top to corners.

8/30/11

Please find the x and y locations for point 1 and 2 in relationship to x0y0.



8/31/11

Please make a sketch of the following part from its code:

```
%
O1235
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF 21)
M1
G0G90G54G43G17X-.5Y-.5Z1.H1S1500M3
Z.1
G1Z-.25F5.M8
G1G41X0D21
Y3.5
G2X.5Y4.R.5
G1X3.
X6.Y2.
Y0
X-.2
G1G40X-.5Y-.5
Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/1/11

Please make a sketch of the following part from its code:

```
%
O1236
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF21)
M1
G0G90G54G43G17X0Y0Z1.H1S1500M3
Z.1
G98G83Z-.25R.1Q.05F20.
X1.Y1.
X-1.
G80
X-2.5Y0
G1Z-.25F20.
G1G41X-2.125D21
G2X-2.125Y0I2.125J0
G1G40X-2.5
G0Z.1
X1.Y-1.
G1Z-.25
G2X0Y-1.4142R1.4142
G2X-1Y-1.R1.4142
G0Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/2/11

You may use the internet for the following questions:

What is SkillsUSA?

What is the SkillsUSA Creed?

Daily Questions
CAD/CAM/CNC and Manual Programming (MTT 130 & MTT 132)

8/15/11

In terms of CNC, what is an ATC?

What is an MCU?

Why must a CNC use a ball screw in place of an acme lead screw?

8/16/11

What is a modal code?

What is another name for the Cartesian coordinate system?

8/17/11

What H-code must be used if one is using tool #7?

What D-code must one use if tool #12 is being programmed?

What is the minimum movement or distance allowed when calling or canceling cutter compensation (G41, G42 or G40)?

8/18/11

What is the character that ends each line of code? (You will need to look this up in section 8, unit 1.)

Explain the purpose of the safe start portion on a CNC code.

8/19/11

What are two advantages to a shrink fit tool holder?

8/22/11

What are a VMC and an HMC?

What is a tomb stone in CNC terms?

Explain how to use a step clamp correctly.

8/23/11

Explain G98 and G99

If a G01 line of code is called with no F code, what feed will the machine run?

8/24/11

The combination of the machining operations required to produce a part is called a manufacturing _____. (Page 634)

What is process planning?

What type of information can be found on a process plan? (Page 149)

8/25/11

Please write a small code to cut a one inch by one inch square one fourth of an inch thick no peeking at an old program.

8/26/11

Which coordinate system uses an angle and a distance to indentify a position?

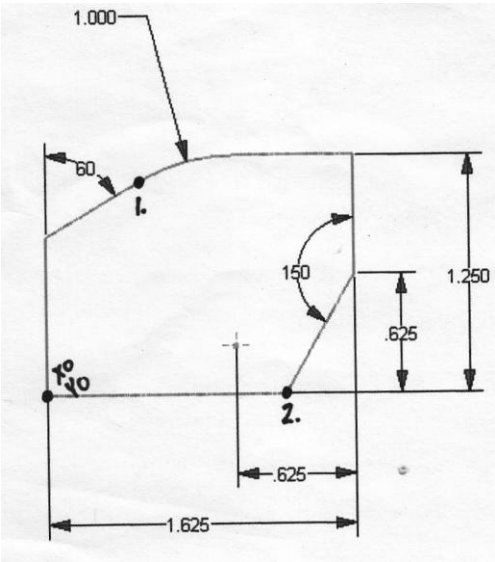
What is wrong with the following line of code:
G1 G41 X2.7798 Y2.9431

8/29/11

Please write a small code to cut a two inch by two inch square one fourth of an inch thick no peeking at an old program. Please put a ¼" chamfer on the bottom two corners and ¼: radii on the top to corners.

8/30/11

Please find the x and y locations for point 1 and 2 in relationship to x0y0.



8/31/11

Please make a sketch of the following part from its code:

```
%
O1235
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF 21)
M1
G0G90G54G43G17X-.5Y-.5Z1.H1S1500M3
Z.1
G1Z-.25F5.M8
G1G41X0D21
Y3.5
G2X.5Y4.R.5
G1X3.
X6.Y2.
Y0
X-.2
G1G40X-.5Y-.5
Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/1/11

Please make a sketch of the following part from its code:

```
%
O1236
G91G28Z0
G28X0Y0
G90G80G40G20
T1M6(1/2 END MILL LOFF1 DOFF21)
M1
G0G90G54G43G17X0Y0Z1.H1S1500M3
Z.1
G98G83Z-.25R.1Q.05F20.
X1.Y1.
X-1.
G80
X-2.5Y0
G1Z-.25F20.
G1G41X-2.125D21
G2X-2.125Y0I2.125J0
G1G40X-2.5
G0Z.1
X1.Y-1.
G1Z-.25
G2X0Y-1.4142R1.4142
G2X-1Y-1.R1.4142
G0Z.1
G91G28Z0
G28X0Y0
M30
%
```

9/2/11

You may use the internet for the following questions:

What is SkillsUSA?

What is the SkillsUSA Creed?

9/6/11

What type of word would be used for setting a CNC machines feed?

What type of word would be used to setting a CNC machines speed?

9/7/11

What does the “M” in m-code stand for?

9/8/11

What type of motor is used in most CNC axis drive applications?

9/9/11

What is connected to the motor of a CNC machine that tells it how far it has moved?

9/12/11

What RPM would one run a 3/4” 4 flute end mill if machining brass? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/13/11

What RPM would one run a 2.5” 6 flute face mill if machining Die Steel? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/14/11

What is the volume in Lbs/in^3 of a 6” diameter by 4’ bar of 1018 CRS?

What would it weight in pounds at a density of .284 lb/in^3?

How much would it cost at $2.00 per pound?

9/15/11

How much would a 2” diameter by 12” long bar of 4140 cost if its density is .284 lb/in³ at $3.22 per pound?

9/16/11

How much would a 2” by 2” by 5” bar of gold cost if its density is .682 lb/in³ at $1,880.00 per oz.?

9/19/11

Please program a Ø5” circle using I’s and J’s with X0 Y0 in the center of the circle.

9/20/11

What RPM would one run a 1” 4 flute end mill if machining Die Steel? Use the slowest cutting speed from your chart.

What feed rate should the above end mill run?

9/21/11

Please measure the bronze bushing as it comes around the room and calculate the weight.

9/22/11

If Blake’s head was cylidrical shaped and it measured 9” in diameter and from top to chin was 11” long, how many cubic inches of brains would fit in it?

9/23/11

What is G54? (Explain your answer)

9/26/11

Why is it important to process plan a part?

9/27/11

What is the largest diameter tool that can be used to machine an interior radius of 5/8”?

What is the largest hex that may be machined from a 2” diameter round bar?

9/28/11

What is an apprenticeship?

9/29/11

Atlas fieldtrip!

10/10/11

When drawing a circle in MasterCAM, does one put in the radius or the diameter?

10/11/11

Please write the decimal equivalents for all odd 8^{th} and 16^{th} fractions.

10/12/11

What should be done to insure that a line is vertical when creating it in MasterCAM?

What is the difference between a view plane and a construction plane?

10/13/11

What is a Tool Plane?

How can the selection of a tool plane affect the part program?

10/14/11

What is the tap drill size for a 3/4 - 10 UNC 3B nut? (use a calculator only)

What should the feed rate be if rigid tapping on a CNC milling machine at an RPM of 200 for a 3/8- 16 UNC tap?

10/17/11

What toolpath would be best to cut just the profile of a part when using MasterCAM?

What toolpath would be best to cut a rectangular hole into a part when using MasterCAM?

10/18/11

What is the difference between stock origin and part origin?

10/19/11

What does the term tangent mean?

10/20/11

Without a calculator, what is one half of 7/16, 15/16, 7/8 and 11/32?

10/21/11

When trimming, what would cause the opposite site of the line you what to disappear?

Bell Ringers Mrs. Vessels	Monday	Tuesday	Wednesday	Thursday	Friday
April 16-20	What extension do you save your documents with?	What is the deadline date for your final?	what are the three primary image files used in Dreamweaver?	Positioning an image is called what?	What F key launches the Test in browser feature?
April 23-27	What does the .bmp extension stand for?	What tags define the beginning and end of the body section of a Web page?	RGB stands for what?	What is the new color that has been added to the RGB color code?	The default color for visited links, or links that have been previously clicked is?
April 30-May 4	The default color for unvisited links, or links that the viewer has not clicked yet is?	The hexadecimal value of white is?	What heading is the largest heading format size?	What heading is the smallest heading format size?	Which of the following is not a forbidden character for filenames of Web pages?
May 7-11	What is the HTML code for a Heading 4 tag is?	When the paragraph is centered, the HTML code align="center" is added to the ____ tag.	Finals	Finals	Finals

Bell Ringers Mrs. Vessels	Monday	Tuesday	Wednesday	Thursday	Friday
April 16-20	What indicates where you are at any time within the movie and allows you to insert, delete, select and move files?	What panel contains a set of tools used to draw and edit graphics and text?	What tool is used to reshape objects?	What tool is used to transform objects by rotating, scaling, skewing, and distorting them?	What tool is used to transform a gradient fill by adjusting the size, direction, or center of the fill?
April 23-27	What tool is used to select objects or parts of objects?	What tool is used to draw lines and curves by creating a series of dots, known as anchor points, that are automatically connected?	What tool is used to create and edit text?	What tool is used to draw oval shapes?	What tool is used to draw freehand lines and shapes?
April 30-May 4	What tool is used to draw (paint) with brushlike strokes?	What tool is used to apply line colors and thickness to the stroke of an object?	What tool is used to fill enclosed areas of a drawing with color?	What tool is used to select stroke, fill, and text attributes so they can be copied from one object to another?	What tool to select part or all of an object, and to select multiple objects?
May 7-11	#000000 represents what color?	#FFFFFF represents what color?	Finals	Finals	Finals

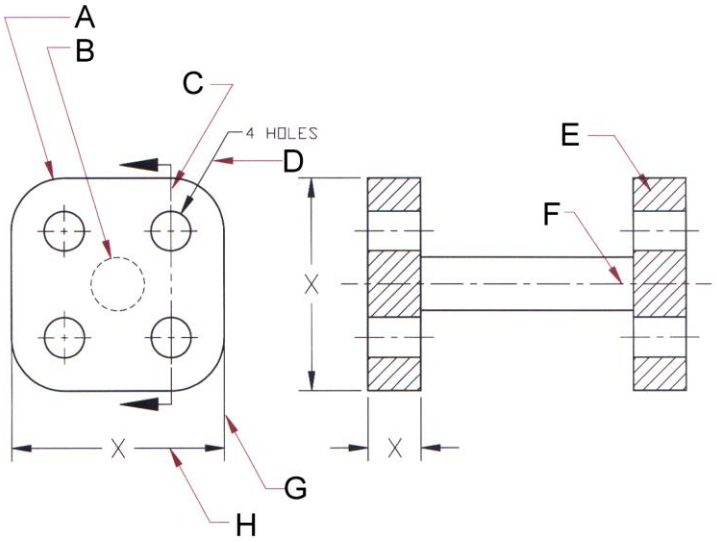
Daily Questions
Introduction to Computer Aided Design (DFT 122)

8/15/11

Describe orthographic projection.

What type of view is used to show a 3D likeness of a part or object?
(Hint, we used them at the top right of the drawings we made in unit 2)

8/16/11 Please label the following line types:



8/17/11

What are the eight steps in the engineering design process?

8/18/11

How is a solid model defined?

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What is software?

What is hardware?

9/28/11

What is an input device?

What is an output device?

9/29/11

Atlas fieldtrip!

10/10/11

When creating a “Bi-Directional” offset, what two ways may the ends of the feature be capped?

Is the slot tool a feature or a sketch tool?

10/11/11

What does the following symbol mean: ©

How is it important to a CAD designer or engineer?

10/12/11

How does an understanding of the CAD functions save time and money?

10/13/11

Why is it important to plan your sketch before drawing?

10/14/11

Explain how the lines used in Mechanical Drawings impact the sketch.

10/17/11

What type of parts are created using the revolve feature command?

10/18/11

Does one have to have a sketch to make a revolved feature?

10/19/11

Do thin features require a closed profile?

10/20/11

Does a boss revolve add or remove material?

10/21/11

Do revolve features have to be 360°?

10/24/11

Can the revolve feature be used to create square parts?

What is the first step in the engineering design process?

10/25/11

True or false, one can only extrude closed profiles.

How would one dimension a diameter instead of radius from center of a sketch used for a revolved feature?

10/26/11

To make a cut that stops a given distance from the opposite surface, use what option in extrude cut?

10/27/11

Can the trim command be used to extend a line?

10/28/11

Why must we have a process for design such as the engineering design process?
Give an example of where the engineering design process would come in handy.

10/31/11

Happy Halloween!

By default where does SolidWorks add the first hole when using the “Hole Wizard”?

11/1/11

What type of holes does the “Hole Wizard” let one create?

11/2/11

When using a sketch driven pattern, will the entities in the pattern be fully defined by default?

11/3/11

How would one attach the midpoint of a line to the origin?

11/4/11

What is a child sketch?

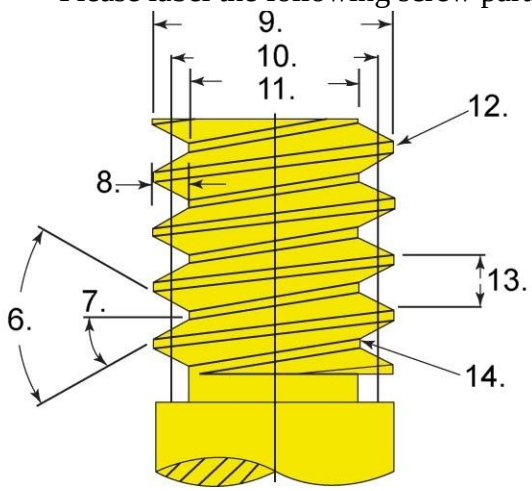
How many child sketches appear when using the “Hole Wizard”?

11/9/11

Please draw a 3” diameter shaft 6” long. Place a ¾ -10 UNC 2B by 1” deep tapped hole in one end. Place a 1” wide flat in the center of the shaft. The flat must be 1.25 from the center of the part. Cut a 1/8” chamfer on the outside of both ends of the part. Set the material to 6061 T6 aluminum. What does the part weigh?

11/10/11

Please label the following screw parts:



11/11/11

Please explain what each part of the following thread designation means:
7/16-20 UNF 3A

Please explain what each part of the following thread designation means:
M8 x 1.5

11/14/11

Please draw a 1.5” wide, from the flats, hexagon. It must be 1” long with a hole thru the center that is sized for a 7/16-14 UNC 3A S.H.C.S. (socket head cap screw). Please use the Machinery’s Handbook or the Student’s Shop Reference to look up the hole’s diameters and depths.

How far would the above mentioned S.H.C.S. move in 10 full revolutions?

11/15/11

List the eight Steps in the Engineering Design Process.

11/16/11

Please draw a brass 1.75” diameter hub with an Ø1” hole thru the center and a 3” diameter flange that is .25” thick. The overall length of the hub should be 1.5” including the flange. There should be a 2.25” diameter B.H.C. (Bolt Hole Circle) thru the flange with four .25” diameter holes equally spaced around the centerline of the hub.

11/17/11

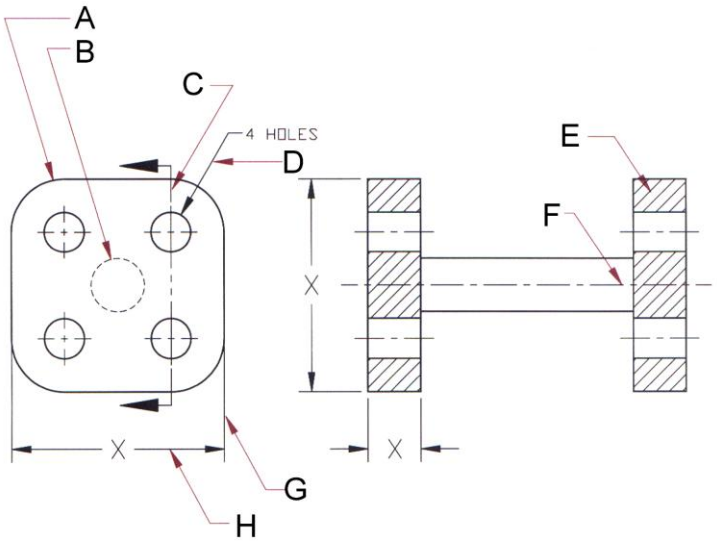
What is the volume of a 6” diameter 7’ long piece of steel?

11/18/11

If one uses the hole wizard to produce a threaded hole and the thread does not show on the part, what must be done to correct this?

11/21/11

Without looking at any reference materials please label the following line types:



11/22/11

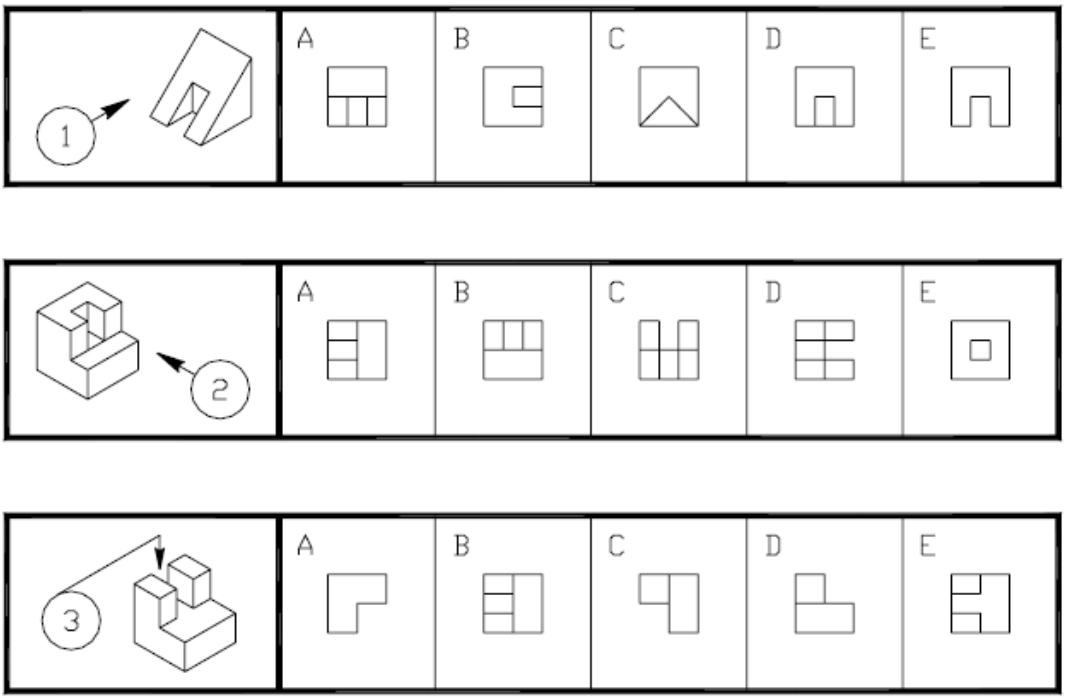
No question! Happy Thanksgiving! Gobble! Gobble!

11/28/11

What is a good way to check where a missing relation is?

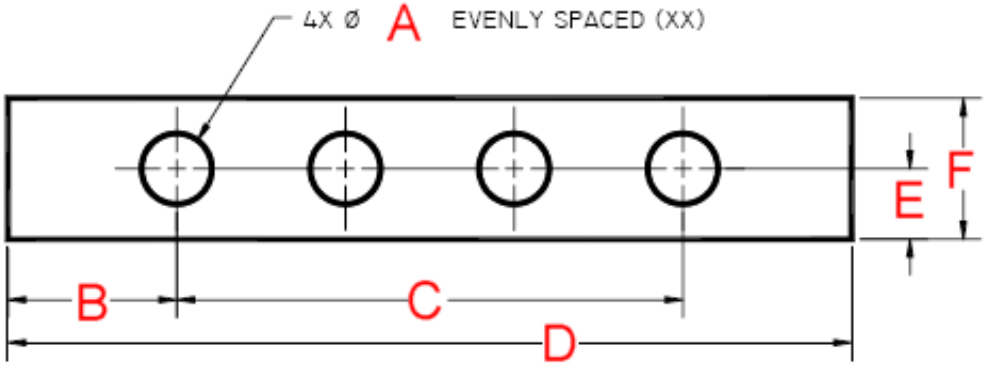
11/29/11

Given the isometric view of an object select it's proper front, right, side, or missing view.



11/30/11

Please sketch the following drawing and label each dimension either location or size:



12/1/11

Please make a note of the following information. We will be using it for the next few days for questions and quizzes.

Dimensioning Standards and Terminology

Dimensioning practices and Rules based on ASME Y14.5M 1994. Identify geometric symbols but not geometric dimensioning and tolerancing practices.

12/2/11

What do the terms Unidirectional and Aligned mean in terms of <u>dimensioning systems</u>? This is not the tolerance types of unilateral and bilateral. You may use your ADDA packet for the answer.

12/5/11

What is the difference between **Allowance** and **Clearance**?

Define **Actual Size**.

12/6/11

What is the icon for a concentric mate?

Describe what exactly a concentric mate does.

12/7/11

_____ – The space between two mating parts.

_____ – The maximum hole diameter or minimum shaft diameter. When a part weighs the least.

_____ - The maximum and minimum allowable sizes of a feature.

_____ – The minimum clearance or maximum interference between two mating parts.

12/8/11

_____ – The size of the part as measured.

_____ - The size from which the limits of size are derived by the application of allowances and tolerance.

12/9/11

_____ – The minimum hole diameter or maximum shaft diameter. When the part weighs the most.

_____- A portion of a part, such as a hole, keyway, or flat surface.

12/12/11

Define Unilateral and Bilateral Tolerances.

12/13/11

Define Specific and General Tolerances.

12/14/11 to 1/4/12

No Question! Merry Christmas!

1/4/2012

Define:
Actual Size
Allowance
Basic Size
Clearance

1/5/2012

Define:
Feature
Least Material Condition
Limits
Maximum Material Condition

1/6/2012

Define:
Reference Dimension
Tolerance
General Tolerance
Unilateral Tolerance
Bilateral Tolerance
Specific Tolerance

1/9/12

What is the definition of an acute triangle?

What is the definition of an obtuse triangle?

Study the general drafting terminology section on geometric terms in your ADDA test prep booklet!

1/10/12

Please convert the following numbers from inches to millimeters or millimeters to inches as needed:

7”
3”
7.4375”

99mm
250mm
70mm

1/11/12

What is the definition of a right triangle?

Please sketch a trapezoid.

Define Rhombus.

1/12/12

Define basic hole system.

Define basic shaft system.

1/13/12

Define clearance fit tolerance.

Define interference fit tolerance.

Define transitional fit tolerance.

1/17/12

What symbol should precede a diameter dimension?

What symbol should precede a Radius dimension?

1/18/12

How tall should dimensional figures be drawn?

1/19/12

When is it OK to cross dimension and extension lines?

How should cylindrical features be located on drawings?

1/20/12

What abbreviation can be used for non-critical repeated features such as fillets and rounds?

What is the correct number of dimensions to have on a drawing?

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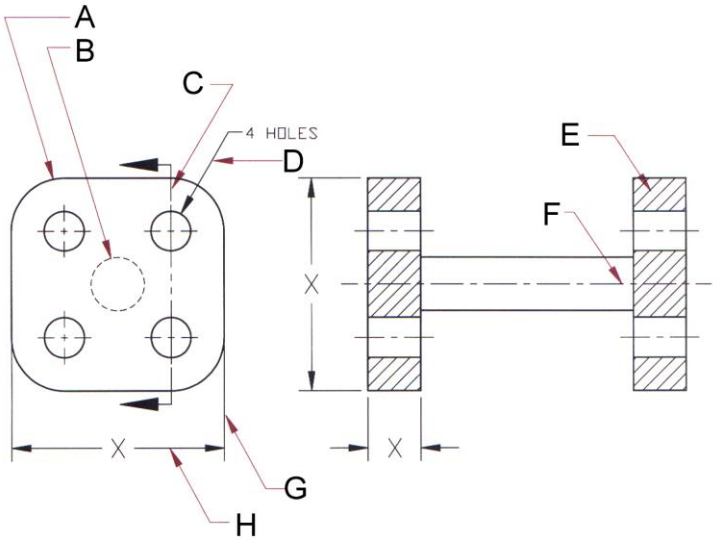

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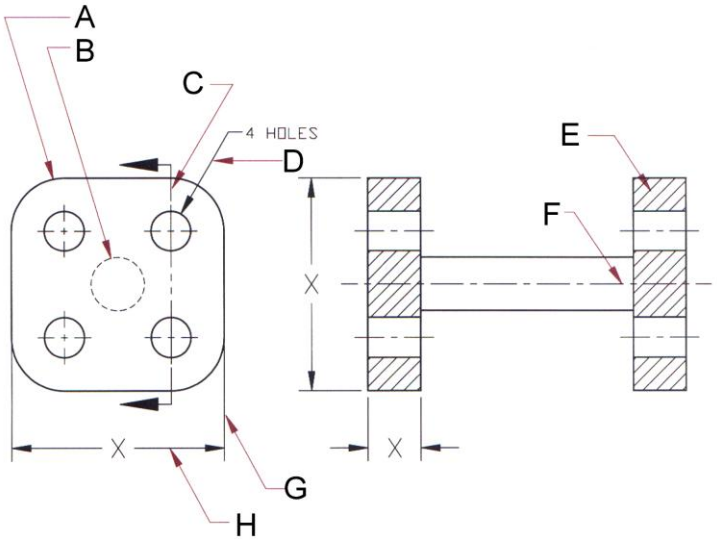

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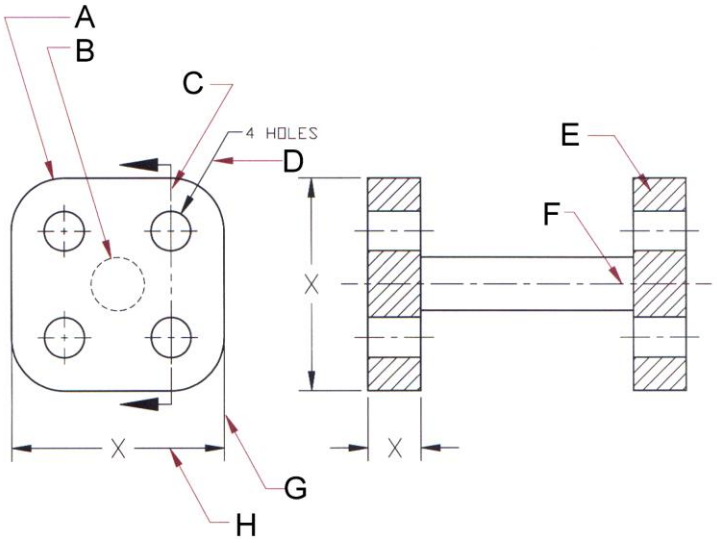

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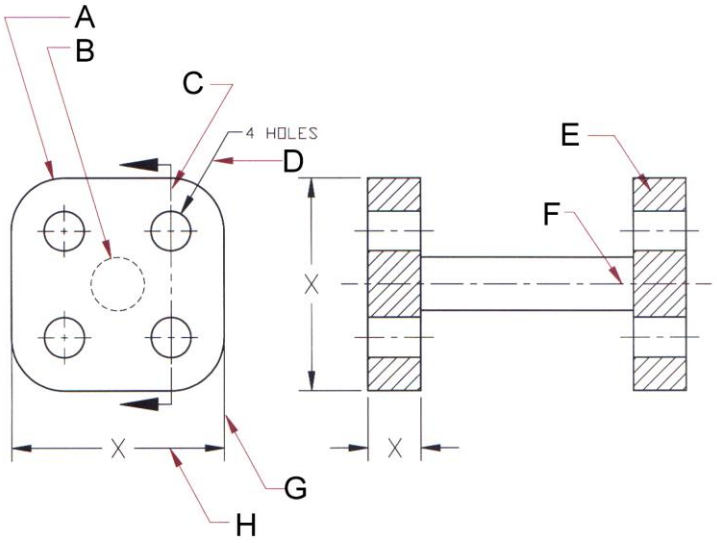

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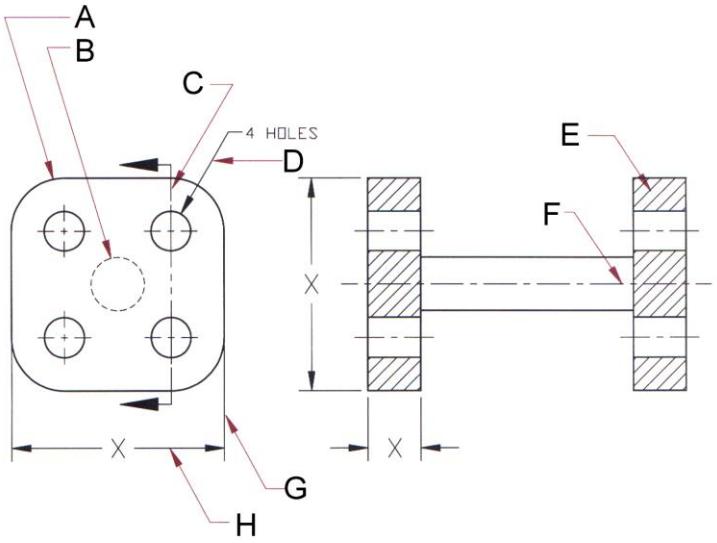

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If an assembly file were E-mailed to a friend without the parts files, would the assembly file still open correctly on the new computer?

8/19/11

What are the first 4 steps in the engineering design process?

8/22/11

What are the last 4 steps in the engineering design process?

8/23/11

No Question! Study for test!

8/24/11

What is parametric modeling?

What are its advantages over conventional design tools?

8/25/11

How would one edit a sketch that has already been extruded?

If a file starts in metric, how would one go about changing it back to inches?

8/26/11

How does one know if a sketch is fully defined?

Why must a sketch be fully defined?

What may result if a sketch is under defined?

8/29/11

Please draw a one inch by two inch by three inch rectangular prism. Place a one fourth of an inch hole thru the center of the part with a seven sixteenths diameter counter bore that is three eighths of an inch deep on one of the two inch by three inch faces. Change the material to 6061-T6 Aluminum.

What does the above mentioned part weight?

8/30/11

How many times one select “Remove Appearance” before Solidworks will remove all colors applied?

What is the volume of a 3” by 3” by 7” rectangular prism?

What is the volume of a 10” long 4” diameter shaft?

8/31/11

The following daily questions will also be used as a quiz grade. Please put space between you and your neighbor. I will scroll down as soon as this is done.

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How much would a 7” by 5” by 2’ bar of Aluminum 6061 cost if the price per pound was $3.76.

How much would a 5” diameter by 6’ bar of mild steel cost at $2.50 per pound?

How much would a 6” by 6” by 1” thick cast iron, grey, CL35 plate with a 2” diameter hole cast into the center cost at $11.22 per pound?

9/1/11

How much would a 6” by 5” by 3’ bar of Manganese cost if the price per pound was $7.77.

How much would an 11” diameter by 12’ bar of mild steel cost at $2.50 per pound?

How much would a 12” by 6” by 2” thick naval brass, plate with a 3” diameter hole cast into the center cost at $16.00 per pound?

9/2/11

You may use the internet for the following questions:

What is SkillsUSA?

What is the SkillsUSA Creed?

9/6/11

Name two things that Solidworks planes are used for.

When a sketch turns red, what does this mean?

9/7/11

List four ways to begin a smart dimension.

9/8/11

When a sketch turns blue, what does this mean?

9/9/11

When a sketch turns black, what does this mean?

9/12/11

What are the eight steps in the engineering design process?

9/13/11

What are hidden lines used for?

What is the volume of a 6” diameter cylinder 5” long?

9/14/11

List 3 ways to start a new sketch in Solidworks.

What does the “Up to Next” end condition do in a Cut Extrude?

If a circle is gray, what does this mean?

A “Blind” cut extrude maintains parametrics by:

Can a “Through All” cut extrude be created with a mid-plane end condition?

9/15/11

What sketch tools create a radius on a corner?

What does a tangent relation do?

9/16/11

What extrude option would be used to stop a cut a given distance from an opposite surface?

How to you turn a line into a construction line?

9/19/11

What does tangent propagation mean and where can it be found in Solidworks?

9/20/11

Describe the difference between an edge and a face.

How can all edges of a face be filleted at one time?

9/21/11

When using the offset command, what does the “select chain” option do?

9/22/11

What type of feature is created with the revolve command?

9/23/11

What is the shell command used to create?

9/26/11

What is the difference between a fillet and a round? What command or feature is used to create both?

9/27/11

What is software?

What is hardware?

9/28/11

What is an input device?

What is an output device?

9/29/11

Atlas fieldtrip!

10/10/11

When creating a “Bi-Directional” offset, what two ways may the ends of the feature be capped?

Is the slot tool a feature or a sketch tool?

10/11/11

What does the following symbol mean: ©

How is it important to a CAD designer or engineer?

10/12/11

How does an understanding of the CAD functions save time and money?

10/13/11

Why is it important to plan your sketch before drawing?

10/14/11

Explain how the lines used in Mechanical Drawings impact the sketch.

10/17/11

What type of parts are created using the revolve feature command?

10/18/11

Does one have to have a sketch to make a revolved feature?

10/19/11

Do thin features require a closed profile?

10/20/11

Does a boss revolve add or remove material?

10/21/11

Do revolve features have to be 360°?

10/24/11

Can the revolve feature be used to create square parts?

What is the first step in the engineering design process?

10/25/11

True or false, one can only extrude closed profiles.

How would one dimension a diameter instead of radius from center of a sketch used for a revolved feature?

10/26/11

To make a cut that stops a given distance from the opposite surface, use what option in extrude cut?

10/27/11

Can the trim command be used to extend a line?

10/28/11

Why must we have a process for design such as the engineering design process?
Give an example of where the engineering design process would come in handy.

10/31/11

Happy Halloween!

By default where does SolidWorks add the first hole when using the “Hole Wizard”?

11/1/11

What type of holes does the “Hole Wizard” let one create?

11/2/11

When using a sketch driven pattern, will the entities in the pattern be fully defined by default?

11/3/11

How would one attach the midpoint of a line to the origin?

11/4/11

What is a child sketch?

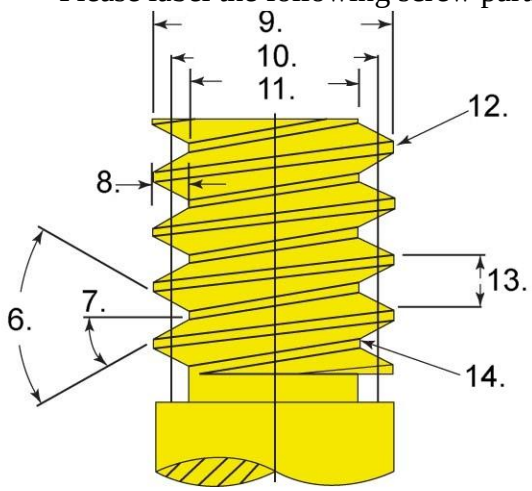
How many child sketches appear when using the “Hole Wizard”?

11/9/11

Please draw a 3” diameter shaft 6” long. Place a ¾ -10 UNC 2B by 1” deep tapped hole in one end. Place a 1” wide flat in the center of the shaft. The flat must be 1.25 from the center of the part. Cut a 1/8” chamfer on the outside of both ends of the part. Set the material to 6061 T6 aluminum. What does the part weigh?

11/10/11

Please label the following screw parts:



11/11/11

Please explain what each part of the following thread designation means:
7/16-20 UNF 3A

Please explain what each part of the following thread designation means:
M8 x 1.5

11/14/11

Please draw a 1.5” wide, from the flats, hexagon. It must be 1” long with a hole thru the center that is sized for a 7/16-14 UNC 3A S.H.C.S. (socket head cap screw). Please use the Machinery’s Handbook or the Student’s Shop Reference to look up the hole’s diameters and depths.

How far would the above mentioned S.H.C.S. move in 10 full revolutions?

11/15/11

List the eight Steps in the Engineering Design Process.

11/16/11

Please draw a brass 1.75” diameter hub with an Ø1” hole thru the center and a 3” diameter flange that is .25” thick. The overall length of the hub should be 1.5” including the flange. There should be a 2.25” diameter B.H.C. (Bolt Hole Circle) thru the flange with four .25” diameter holes equally spaced around the centerline of the hub.

11/17/11

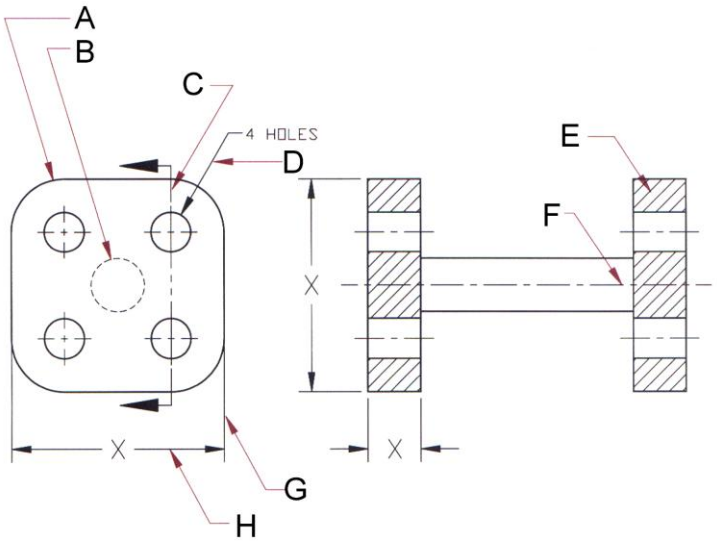
What is the volume of a 6” diameter 7’ long piece of steel?

11/18/11

If one uses the hole wizard to produce a threaded hole and the thread does not show on the part, what must be done to correct this?

11/21/11

Without looking at any reference materials please label the following line types:



11/22/11

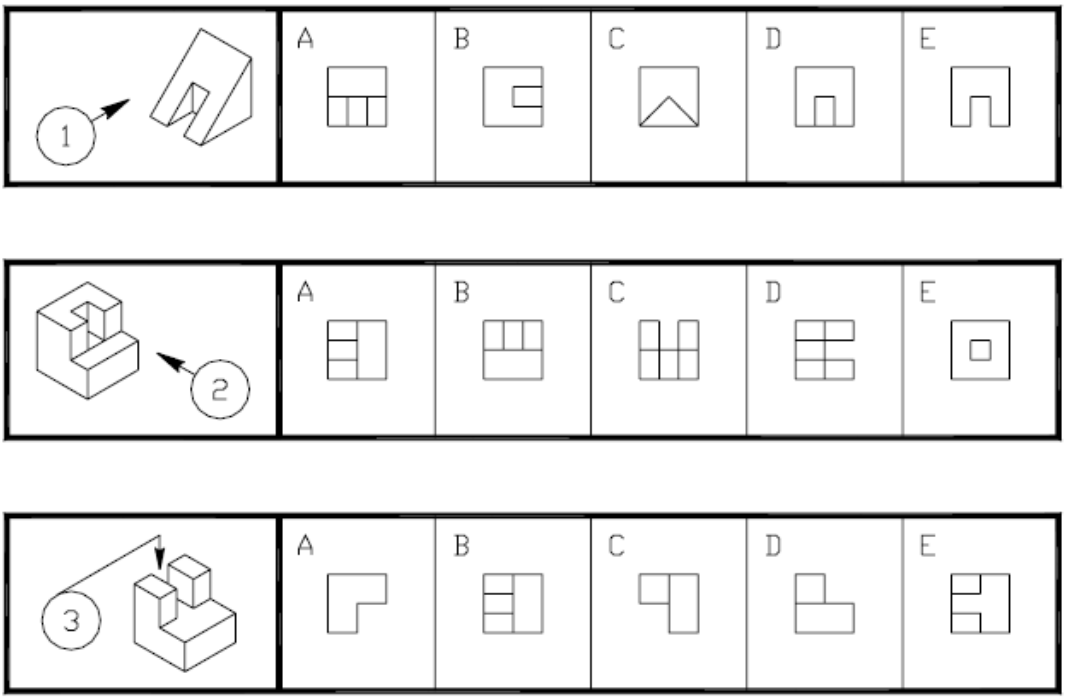
No question! Happy Thanksgiving! Gobble! Gobble!

11/28/11

What is a good way to check where a missing relation is?

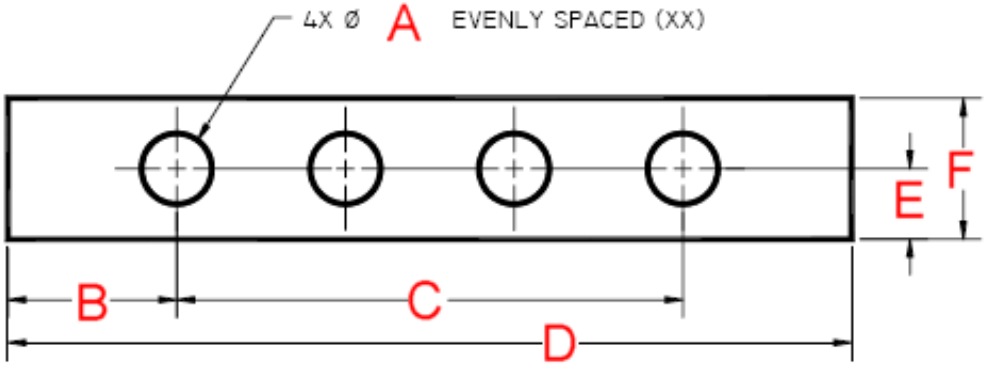
11/29/11

Given the isometric view of an object select it's proper front, right, side, or missing view.



11/30/11

Please sketch the following drawing and label each dimension either location or size:



12/1/11

Please make a note of the following information. We will be using it for the next few days for questions and quizzes.

Dimensioning Standards and Terminology

Dimensioning practices and Rules based on ASME Y14.5M 1994. Identify geometric symbols but not geometric dimensioning and tolerancing practices.

12/2/11

What do the terms Unidirectional and Aligned mean in terms of <u>dimensioning systems</u>? This is not the tolerance types of unilateral and bilateral. You may use your ADDA packet for the answer.

12/5/11

What is the difference between **Allowance** and **Clearance**?

Define **Actual Size**.

12/6/11

What is the icon for a concentric mate?

Describe what exactly a concentric mate does.

12/7/11

_____ – The space between two mating parts.

_____ – The maximum hole diameter or minimum shaft diameter. When a part weighs the least.

_____ - The maximum and minimum allowable sizes of a feature.

_____ – The minimum clearance or maximum interference between two mating parts.

12/8/11

_____ – The size of the part as measured.

_____ - The size from which the limits of size are derived by the application of allowances and tolerance.

12/9/11

_____ – The minimum hole diameter or maximum shaft diameter. When the part weighs the most.

_____- A portion of a part, such as a hole, keyway, or flat surface.

12/12/11

Define Unilateral and Bilateral Tolerances.

12/13/11

Define Specific and General Tolerances.

12/14/11 to 1/4/12

No Question! Merry Christmas!

1/4/2012

Define:
Actual Size
Allowance
Basic Size
Clearance

1/5/2012

Define:
Feature
Least Material Condition
Limits
Maximum Material Condition

1/6/2012

Define:
Reference Dimension
Tolerance
General Tolerance
Unilateral Tolerance
Bilateral Tolerance
Specific Tolerance

1/9/12

What is the definition of an acute triangle?

What is the definition of an obtuse triangle?

Study the general drafting terminology section on geometric terms in your ADDA test prep booklet!

1/10/12

Please convert the following numbers from inches to millimeters or millimeters to inches as needed:

7”
3”
7.4375”

99mm
250mm
70mm

1/11/12

What is the definition of a right triangle?

Please sketch a trapezoid.

Define Rhombus.

1/12/12

Define basic hole system.

Define basic shaft system.

1/13/12

Define clearance fit tolerance.

Define interference fit tolerance.

Define transitional fit tolerance.

1/17/12

What symbol should precede a diameter dimension?

What symbol should precede a Radius dimension?

1/18/12

How tall should dimensional figures be drawn?

1/19/12

When is it OK to cross dimension and extension lines?

How should cylindrical features be located on drawings?

1/20/12

What abbreviation can be used for non-critical repeated features such as fillets and rounds?

What is the correct number of dimensions to have on a drawing?

1/23/12

Is it OK to dimension in such a ways as to force production personal to calculate dimensions?

1/24/12

What is the suggested way of dimensioning to a hidden line?

1/25/12

What does the acronym NTS stand for and when would it be used?

1/26/12

What is a finish mark?

When is it appropriate to omit finish marks?

1/27/12

How far should the first dimension be placed from the view?

How far apart should each dimension be from all others?

1/30/12

What is a mate reference?

If a sub-assembly will not move in another assembly it is said to be _____.

What should be done to make it move?

1/31/12 (Test on Friday instead of Wednesday)

Define obtuse.

Define radius.

Define equilateral triangle.

Define Arc.

Define Chord.

2/1/12

Define the following:

Minor axis
Major axis
Isosceles triangle

2/2/12

Explain first and third angle projection.

Define a complementary angle.

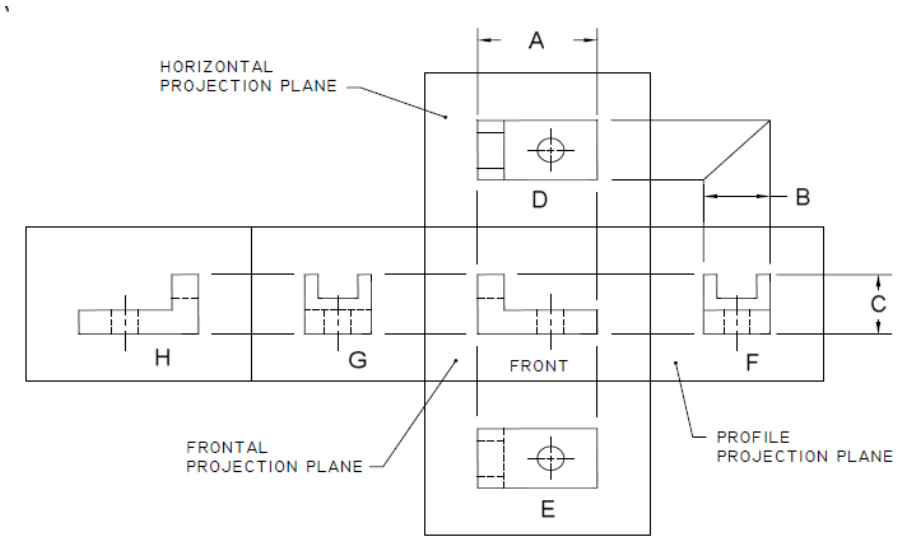
Define a supplementary angle.

2/3/12

What determines to number of views on a drawing? (State the guiding rule for the number of views on a drawing.)

2/6/12

Please write what each letter represents. (Either the view name or height, depth, and width)



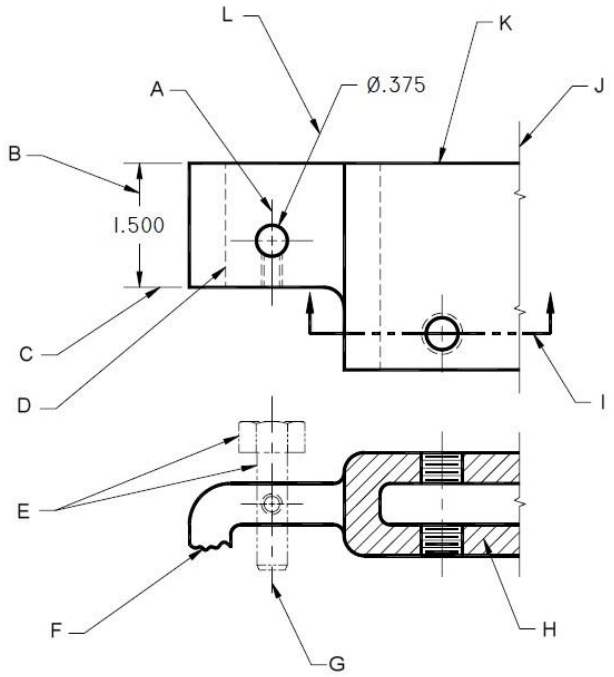
2/7/12

List five rules for selecting the proper front view

2/8/12

What does it mean when a view is said to be foreshortened?

2/9/12 Please label the following line types:



2/10/12

What does the term bore mean?

2/13/12

Please convert the following numbers to millimeters:

10”
35”
2’

2/14/12

Give two examples of how a phantom line is used.

2/15/12

Describe what a visible line is and how it is used on a drawing. Include its thickness as drawn on a drawing.

Describe what a hidden line is and how it is used on a drawing. Include its thickness as drawn on a drawing.

2/16/12

What does the term bore mean?

What does it mean when a hole is said to be blind?

2/21/12

What is a Counterbore?

What is a Counterdrill?

What is a Countersink?

2/22/12

What is a Tap?

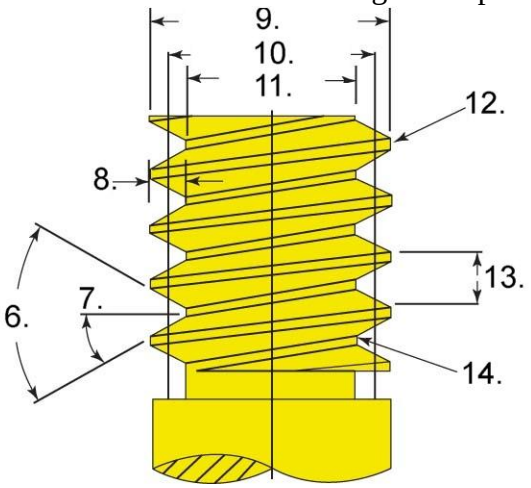
What is a Ream?

What is a Drill?

2/23/12

Review

Please label the following screw parts:



2/24/12

Compare and contrast the terms Pitch and Lead as related to threaded fasteners.

2/27/12

Define Key.

Define Rivet.

Define Spring.

Define Retaining Ring.

2/28/12

What is a title block?

Dimensions on drawings can be designated in what four types of values?

2/29/12

Convert the following numbers into decimal degrees:

32° 15’ 0”
45° 30’ 0”
22° 22’ 15”

Convert the following numbers into degrees, minutes, and seconds:
22.5°
15.25°
45.3047°

3/1/12

What is a dual dimension?

What are tabular dimensions?

What is a tolerance?

3/2/12

What is a bilateral tolerance?

What is a unilateral tolerance?

What is an unspecified tolerance?

What are limits in terms of dimensioning and tolerancing?

3/5/12

What does the term nominal size mean?

What does the term basic size mean?

Can either of the above things be what the part actually measures?

Can the part measure bigger or small that its nominal or basic size?

3/6/12

What is a note?

Where should one look to find a tolerance that is not with the dimension?

3/7/12

Please write an example of the following types of dimensions or tolerences:

Unspecified fraction

Specified fraction

Decimal with a unilateral tolerance

Decimal with a bilateral tolerance

high limit/low limit

3/8/12

No Question!

3/9/12

What is the High limit on .500±.002?

3/12/12

Explain the process of revising a drawing?

What must take place?

What should be on the drawing?

3/13/12

No Question! Work sheets on working drawings!

3/14/12

What is a working drawing?

What is another name for a working drawing?

3/15/12

When can a one view drawing be used?

How many views must a drawing have to be considered a multiview drawing?

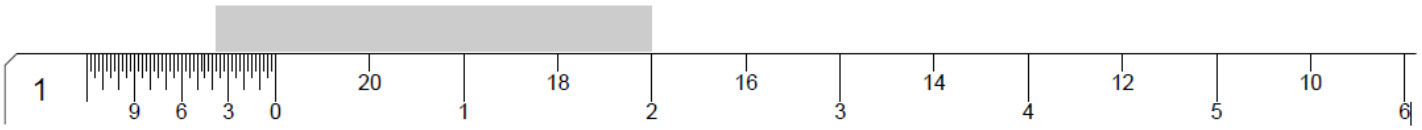
3/16/12

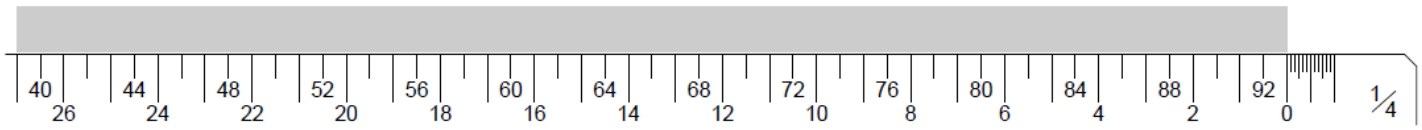
When removing hidden lines, what must be put on the drawing?

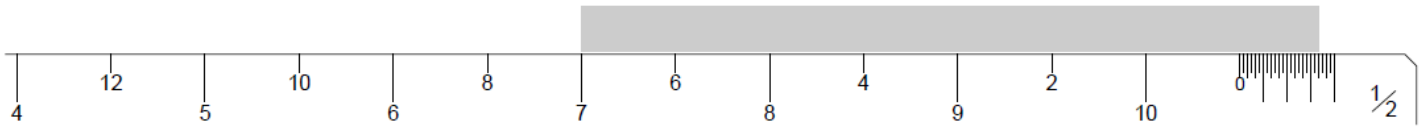
What are the 6 principle views that may be used on a drawing?

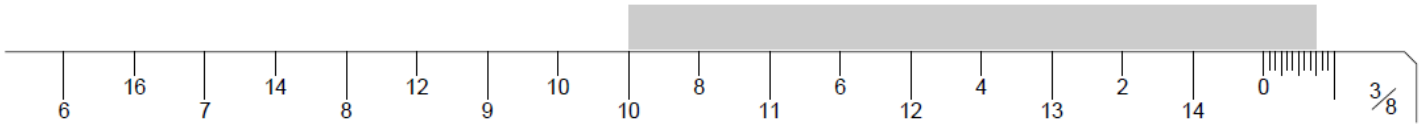
What determines which views go on the drawing?

3/19/13 Please make measurements on the following architect's scale.









3/20/12

Review:

What is a finish mark?

Please draw an example of a 32 MAX Micro inch finish symbol.

What is the decimal equivalent of 32 micro inches?

3/21/12

Review:

Please explain what each part of the following thread designation means:
7/16-20 UNF 3A

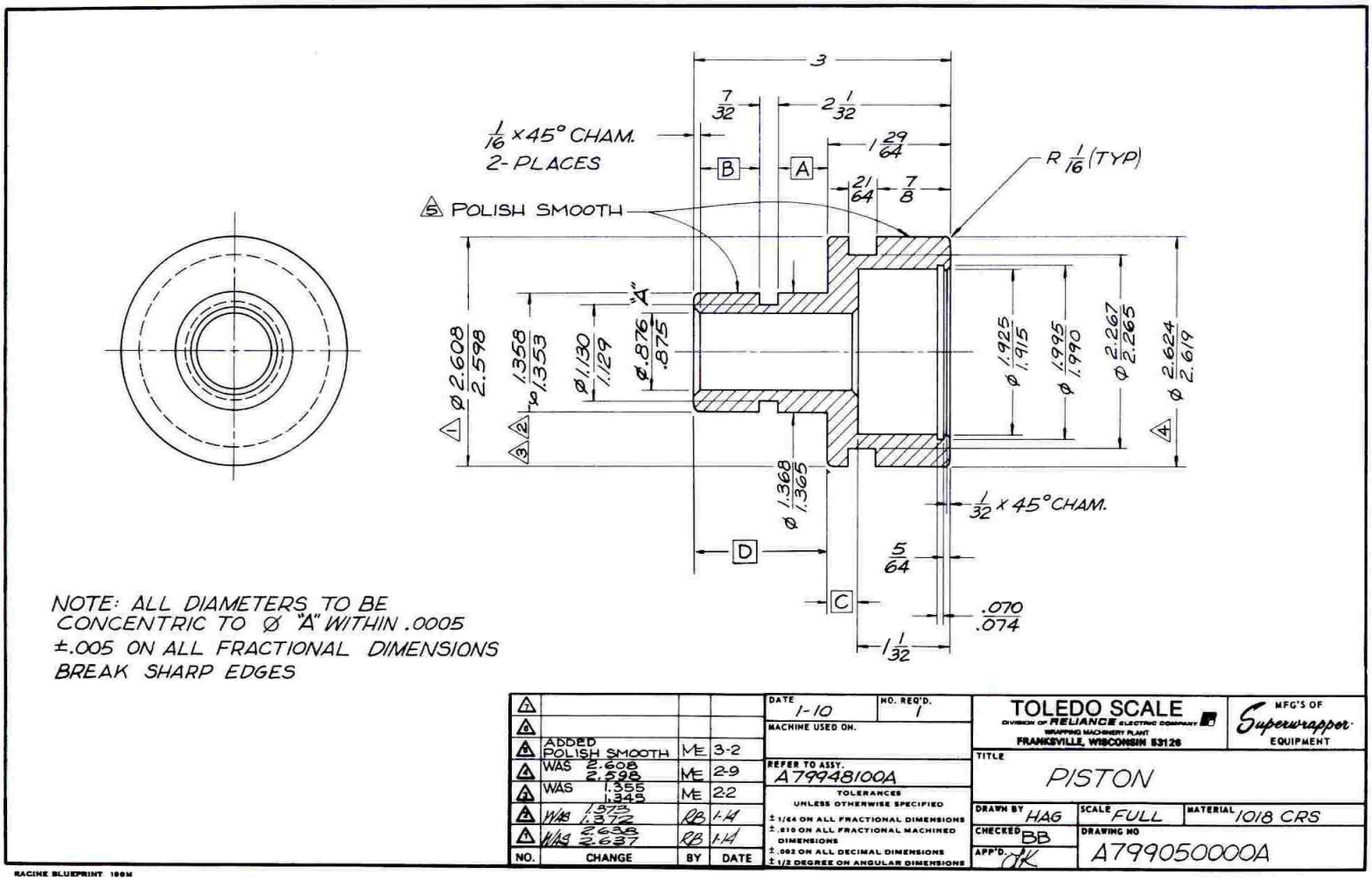
Please explain what each part of the following thread designation means:
M8 x 1.5

3/22/12

Please study the following drawing and answer the question below.

What is the high limit on the internal retaining ring groove?

What size should the radii be that are on the external corners of the part?



The Ø2.608/2.598 dimension has been changed. What was it before the change?
How do we know that it has been changed?
Where is this information found?

3/26/12

What is a shoulder?

List four types of shoulders.

3/27/12

Please sketch a part with a flange.

3/28/12

When a hole does not go through the part it is referred to as what type of hole?

3/29/12

Compare and contrast a spot face and a counter bore.

4/9/12 Review questions this week:

What is parametric modeling?

What are its advantages over conventional design tools?

4/10/12

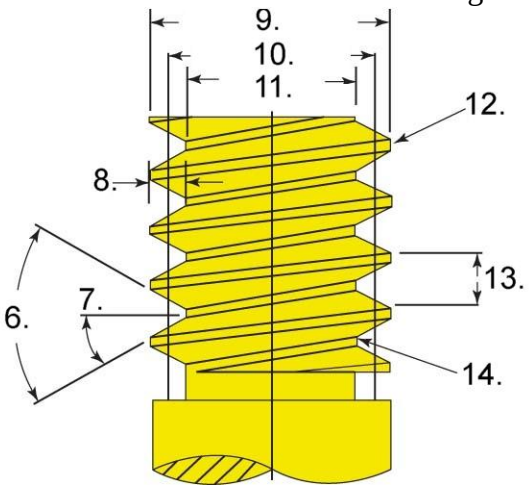
How is a solid model defined?

4/11/12

What are the eight steps in the engineering design process?

4/12/12

Please label the following screw parts:



4/16/12

Please explain what each part of the following thread designation means:
M8 x 1.5

4/17/12

Please write an example of the following types of dimensions or tolerences:

Unspecified fraction

Specified fraction

Decimal with a unilateral tolerance

Decimal with a bilateral tolerance

high limit/low limit

4/18/12

What is a flange?

What is a shoulder?

Please sketch a part that has a flange and a shoulder. Sketch a 4 hole pattern on the flange.

4/19/12

What is a dual dimension?

What are tabular dimensions?

4/20/12

Please sketch the symbol for the following drafting terms:

Counterbore
Countersink
Depth
Diameter
Radius

INTRO Questions:

1. What medical contributions were made by Clara Barton and Sir Alexander Fleming?
2. What is the difference between long term care and assistant living facilities?
3. What is the difference between medicare and Medicaid?
4. Identify three services offered by medical offices?
5. What are three groups of people that are covered under medicare?

Welding I Essential Questions
October 31- November 4 2011

1. Which group of electrodes is low hydrogen type?
a) E7024, E7027, and E7028
b) E6010 and E6011
c) E6012, E6013, and E7014
d) E7015, E7016 and E7018

2. “Arc blow” is caused by
a) strong winds associated with outdoor welding.
b) magnetic forces associated with direct current.
c) too high an amperage for the size of the electrode.
d) too low an amperage for the size of the electrode.

3. When the welding machine is set to DCEP, current flows
a) from the work to the electrode.
b) from the electrode to the work.
c) both to and from the electrode.
d) depending on the electrode being used.

4. Which of the following welding cable sizes is the largest?
a) # 1/0
b) # 2
c) # 1
d) # 2/0

5. Rectifiers are noted for their ability to
a) control welding power.
b) reduce spatter.
c) change AC to DC.
d) eliminate arc blow.

6. In North America, alternating current changes direction
a) once per second.
b) 60 times per second.
c) 120 times per second.
d) 240 times per second.

7. The last digit in the electrode classification E7018 indicates
a) welding position the electrode can be used.
b) minimum tensile strength of the electrode.
c) Type of current and electrode coating.
d) carbon content of the deposited weld.

8.The E7024 electrode can be used in
a) all positions.
b) flat position and horizontal fillets only.
c) flat, horizontal and vertical down positions.
d) flat, horizontal, vertical down and overhead positions.

9. The electrode classification that indicates a deep penetrating electrode that can be used with alternating current (AC) current is
a) E6010.
b) E6011.
c) E6012.
d) E6013.

10. Back-stepping at the end of a weld made with the SMAW process
a) is not done because it traps slag.
b) reduces electrode stub loss.
c) helps to prevent crater cracking.
d) puts too much heat on the electrode holder.

Welding Essential Questions

Aug. 15-19, 2011

Welding I:

1.) What is the most important PPE while entering the welding shop?
2.) Which safety hazard is the most at risk while welding?
3.) The three important things to look for in stored cylinders are?
4.) Why is considered to be the most dangerous piece of equipment in the welding shop?
5.) What is the minimum shade lens while oxy-fuel cutting?
6.) What is the most desired lens while using the SMAW process?
7.) What two materials of clothing are best suited for welding?
8.) What is the most important thing to make sure of when drilling or grinding a piece of steel?
9.) What is the most important PPE when using a side grinder?
10.) What should be done to an acetylene cylinder that has been lying down over night before use?

Welding II:

1.) Define polarity?
2.) How does an E-6010 differ from an E-6011?
3.) Name the three different types of polarity and an electrode that is used on each one?
4.) Why are welding leads made of copper?
5.) What is the major difference in the output of SMAW and GMAW?
6.) What are the outer holes in a torch cutting tip called? What is their purpose?
7.) Define tensile strength?
8.) How do you know what position an electrode can be used?
9.) Why should a welder never be adjusted while in use?
10.) What can happen if a welder is adjusted under a load?

Welding I Essential Questions
November 28- December 2, 2011

1. What is the term for the width of the cut produced by any cutting process?
    a) Drag line
    b) Kerf
    c) Wraparound
    d) Slag

2. Which fuel gas can be used to cut low carbon steel?
    a) MAPP
    b) Propane
    c) Acetylene
    d) All of the above

3. The maximum recommended safe working pressure for Acetylene is
    a) 10 psi.
    b) 15 psi.
    c) 20 psi.
    d) 32 psi.

4. Which oxyacetylene flame has an excess of fuel?
    a) Oxidizing
    b) Neutral
    c) Carburizing
    d) None of the above

5. The oxyfuel process uses oxygen and what other types of gases?
    a) Inert Gases
    b) Reactive Gases
    c) Mixed gases
    d) Flammable gases

6. To insure that oxyfuel lines are not improperly connected, fuel gas hoses are
    a) Red with right-hand threads
    b) Red with left-hand threads
    c) Green with right-hand threads
    d) Green with left-hand threads

7. A fully charged acetylene cylinder contains approximately?
    a) 15 psi @ 70°F
    b) 225 psi @ 70°F
    c) 500 psi @ 70°F
    d) 2,200 psi @ 70°F

8. While cutting with acetylene, the oxygen working pressure is
    a) greater than the acetylene working pressure.
    b) equal to the acetylene working pressure.
    c) less that the acetylene working pressure.
    d) a constant 20 pounds per square inch.

9. While flame cutting, the preheat flames (with the cutting jets open) should be
    a) carburizing.
    b) oxidizing.
    c) neutral.
    d) reducing.

10. Oxyacetylene torches can cut
    a) stainless steel.
    b) aluminum.
    c) copper nickel alloys.
    d) carbon steel.

Welding Quiz
March 16, 2012

1.
2. A_____places parts together in their proper position for the tack welder.

3. A_____ is a piece of sheet metal cut to the shape of a part so that it may be repetitive laid out.

4. List the three types of light that may be present during welding.

5. What is the name of the eye burn that can occur in a fraction of a second?

6. Voltage can be described as_____.

7. Amperage can be described as_____.

8. Wattage can be described as_____.

Welding Essential Questions

Feb. 6- 10, 2012

Name 4 of the stresses that weld joints must withstand.

Tensile
Compression
Bending
Torsion
Shear

Name the 5 joint types used in welding.

Butt
Tee
Lap
Edge
Corner

What position and type of weld would a 1G be? A 1F?

Flat Groove, Flat Fillet

What position and type of weld would a 2G be? A 2F?

Horizontal Groove, Horizontal Fillet

What position and type of weld would a 3G be? A 3F?

Vertical Groove, Vertical Fillet

What position and type of weld would a 4G be? A 4F?

Overhead Groove, Overhead Fillet

What are welding symbols used for?

A shortened way to tell the welder what to do.

How is the reference line always drawn?

Horizontally.

What are the terms *other side* and *arrow side* used to indicate?

Weld location

Sketch and dimension a V-groove weld symbol for a weld on the arrow side, with 1/8-in. root opening, ¾-in. in size, and having a groove angle of 45®.

Welding I Essential Questions March 19-23, 2012

1. Welding with equipment that performs the welding operation only occasional or no observation of the welding with no manual adjustment of equipment controls by a welding operator
    a. Backgouging
    b. As welded
    c. Automatic welding

2. The removal of weld metal and base metal from the other side of a partially welded joint to assure complete penetration upon subsequent welding from that side is
    a. Backgouging
    b. Automatic welding
    c. Base metal

3. A material (base metal, weld metal, carbon or granular materials) placed at the root of a weld joined for the purpose of supporting molten metal is
    a. Fillet weld leg
    b. Backing (faying surface)
    c. Groove angle

4. A weld made on the back of a single groove weld is called a
    a. Back weld
    b. Backing
    c. Backgouging

5. The material or alloy that is welded, braised, soldered or cut is the
    a. Base metal
    b. Consumable insert
    c. Fillet weld size

6. The angle between the bevel of a joint member and a plane perpendicular to the surface of the member is
    a. Convex
    b. Bevel angle
    c. Butt joint angle

7. A joint between two members aligned approximately in the same plane is
    a. Butt joint
    b. Tee joint
    c. Lap joint

8. The maximum distance from the face of a concave fillet weld perpendicular to align joining the toes is
    a. Concavity

b. Convexity
c. Consumable insert

9. Filler metal that is placed at the joint root before welding, and is intended to be completely used into the joint root to become part of the weld is
   a. Consumable insert
   b. Fillet weld size
   c. Backgouge

10. For equal leg fillet welds, the leg lengths of the largest isosceles right triangle that can be inscribed within the fillet weld cross section. For unequal leg fillet welds, the leg lengths of the largest right triangle that can be inscribed within the fillet weld cross section is
   a. Groove weld size
   b. Fillet weld size
   c. Weld size

Bell Ringers Mrs. Vessels	Monday	Tuesday	Wednesday	Thursday	Friday
April 16-20	Which of the following is a paragraph tag?	A(n) ____ is the exact Internet address of a Web file	Which of these top-level domains stands for education?	The ____ tag identifies the file as an HTML document to the program opening it.	The ____ tag identifies the page contents that appear in the browser window.
April 23-27	Having ____ access means you can post files to a server.	Which of the following is an example of text weight?	Use no more than ____ main colors consistently throughout your site.	The default text-align style value is ____.	Which of the following is available only to devices that can visually display text?
April 30-May 4	Linked text is ____ by default.	Avoid using the ____ tag.	A _____ is the intersection of a horizontal and a vertical line of data in a grid.	A _____ is a layout that allows you to present information in a grid.	A _____ is a single vertical line of data in a grid.
May 7-11	A _____ is a single horizontal line of data in a grid.	The _____ tag pair formats data as a table data cell.	Finals	Finals	Finals

Scoring Rubric for Kentucky On-Demand Writing

4 Points:

Writers at this score point level display consistent, though not necessarily perfect, writing skill, resulting in effective communication.

- The writer establishes and maintains focus on a**udience and purpose** and effectively engages the audience by providing relevant background information necessary to anticipate its needs.
- The writer consistently **develops ideas** with depth and complexity to provide insight, support, and clarification of the topic. The writer consistently develops ideas using appropriate and effective examples, details, facts, explanations, descriptions, or arguments. In grades 5 and 6, writers may address counterclaims in support of opinion and argument; in grades 8, 10 and 11, counterclaims are addressed effectively to help support arguments. The writer may use a variety of techniques or approaches.
- The writer consistently **organizes** the writing by using a logical progression of ideas that flows within and between paragraphs. The writer consistently uses a **variety of sentence lengths and structures.** The writing includes a variety of transitional words and phrases that connects ideas and guides the reader. The writer uses appropriate organizational techniques (e.g., comparison/contrast, cause/effect, order of importance, reasons/explanations).
- The writer maintains an appropriate voice or tone. The writer consistently **chooses words** that are appropriate to the intended audience and purpose of the writing. The writer consistently uses correct **grammar, usage, and mechanics** (e.g., spelling, punctuation, capitalization) to communicate effectively and clarify the writing.

3 Points:

Writers at this score point level display adequate writing skill, resulting in effective, though not consistent, communication.

- The writer adequately establishes focus on the intended **audience and purpose**, but may not consistently maintain this focus, losing sight of audience or purpose on occasion. The writer provides adequate background information that generally anticipates audience needs.
- The writer **develops ideas** with adequate support, and clarification of the topic through examples, details, facts, explanations, descriptions, or arguments. In supporting arguments and opinions, the writer in grades 5 or 6 may address counterclaims; the writer in grades 8, 10 and 11 addresses or considers counterclaims. The writer may use different techniques or approaches, but some are less successful than others; one technique may be prominent.
- The writer adequately **organizes** the writing by using a logical progression of ideas that generally flows from idea to idea, though connections between some ideas are less clear on occasion. The writer displays **variety in sentence lengths and structures.** The writing includes transitional words and phrases that generally guide the reader. The writer generally maintains organizational techniques, but organization and connection of ideas may become less clear on occasion.
- The writer may have occasional lapses in language that cause voice or tone to weaken. The writer **chooses words** that are generally appropriate for the intended audience and writing purpose. The writer adequately demonstrates correct **grammar, usage, and mechanics** (e.g., spelling, punctuation, capitalization) to communicate A few errors may occur that do not impede understanding.

2 Points:

Writers at this score point level display developing writing skill, resulting in less effective communication.

- The writer identifies a generalized **purpose or audience** but does not maintain focus on both. Instead, the writer focuses more on the task (creating a letter, speech, etc.) than the actual purpose or intended audience. Irrelevant or inconsistent background information demonstrates a general lack of awareness of audience needs.
- The writer demonstrates inconsistent **development of ideas** often presenting facts (sometimes in isolation from one another) with little insight, interpretation, or clarification. The writer provides minimal or irrelevant examples and/or details for support. The writer in grades 8, 10, and 11 may attempt to address counterclaims in support of arguments or is unsuccessful in the attempt. If the writer attempts to use different techniques or approaches, their relation to the writing purpose may be unclear.
- The writer demonstrates some attempt at **organization**, but often places ideas in an unclear order that disrupts the natural flow or cohesion. The writer occasionally uses varied sentence structures, but these appear alongside mostly **simple sentences**. Transitions are simple and infrequent. The writer may use organizational strategies inappropriately or ineffectively, such as attempting to use a comparison when it is not warranted.
- The writer often uses language that causes voice or tone to weaken or emerge only on occasion. The writer occasionally chooses appropriate **words**, but these appear alongside language that is simple or inappropriate for the intended audience or purpose. Frequent errors in **grammar, usage, and mechanics** (e.g., spelling, punctuation, capitalization) appear alongside occasional control of these features and may impede understanding of the text.

1 Point:

Writers at this score level demonstrate little or no writing skill, resulting in mostly ineffective communication.

- The writer may identify a general topic but demonstrates little or no awareness of **purpose or audience**. The writer does not provide background or show awareness of the needs of the audience.
- The writer gives little or no purposeful **development of ideas,** interpretation, insight or clarification. The writer provides no examples and/or details for support or the support is inaccurate or irrelevant. The writer in grades 8, 10, 11 does not address counterclaims in support of argument or opinion.
- The writer offers little or no **organizational structure**, placing ideas in no logical order. The writer uses little if any **variety in sentence structures.** Ineffective or absent paragraph divisions create a lack of cohesion. Few, if any, transition words or phrases are used.
- The writer's tone or voice is either inappropriate or absent. The writer uses simple or inappropriate **words**. Errors that appear in **grammar, usage,** and **mechanics** (e.g., spelling, punctuation, capitalization) impede understanding of the text.

Daily Questions
Machine Tool Technology I (MTT 110 & MTT 112)

8/15/11

What is semi-precision measurement?

What is comparison measurement?

List the parts of a combination set.

8/16/11

What type of fixed gage can be used to check hole diameters?

What fixed gage can be used to check a threaded hole?

What is the name of the process of attaching gage blocks to each other?

8/17/11

What would the gage block stack be if one were to set a sine bar at 22°?

Use the chart of available gage blocks on page 108 (figure 2.4.25) in you text to determine what blocks would be used for the above mentioned stack.

8/18/11

What is the smallest graduation on an English vernier caliper?

What type of fixed gage can be used to check external threads?

List three rules to follow when using or storing semi-precision or precision measuring tools.

8/19/11

What is the smallest graduation on an inch micrometer with a vernier scale?

What is calibration and why is it important?

8/22/11

What type of tool is a telescoping gage?

What do telescoping gages measure?

What is an indicator used for?

8/23/11

List the two most common methods of measuring surface finish.

What does CMM stand for?

8/24/11

What are adjustable parallels and how are they used?

8/25/11

Please convert the following numbers to either inches or mm. Round to ten thousands place for inches and hundredths of an mm:
27mm
15mm
350mm
7 inches
2.5 inches
1.06299 inches

8/26/11

What is QA?

Why is it important?

8/29/11

What is a Process Plan?

Why should we make process plans?

What type of information can be found on a process plan?

8/30/11

What is layout fluid?

What are dividers used for in terms of layout?

What are trammel points?

8/31/11

What is the most common injury that may occur during a filing operation?

The best way to clean the chips out of a file is to use:

What does the term “pinning” refer to in terms of filing?

9/1/11

Please write your fractions to decimal equivalents for 1/8ths & 1/16ths.

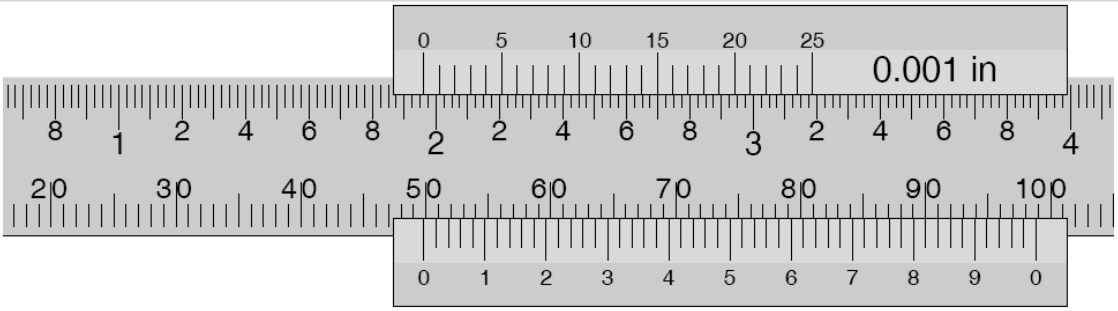
9/2/11

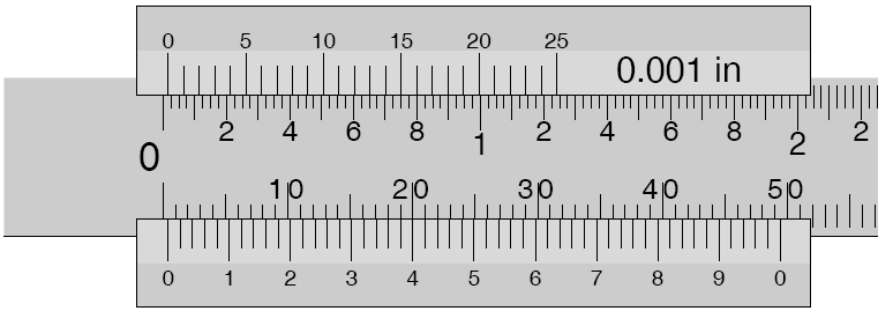
You may use the internet for the following questions:

What is SkillsUSA?

What is the SkillsUSA Creed?

9/6/11 Please write the reading for the following vernier tools.





9/7/11

What tool would be used to layout an angle accurate within .125 degrees?

9/8/11

Please write the 1/8ths and 1/16ths as decimals.

9/9/11

Why is it important to know your fraction to decimal equivalents?

9/12/11

What direction should a file be moved when filing?

What is used to clean a file?

9/13/11

What does square mean?

How would one check to see if a part is square?

9/14/11

Please write the measurements for the vernier calipers on the math worksheet site page on the board.

9/15/11

What is the magic number to convert millimeters to inches?

Please convert the following numbers to inches:
22MM
300MM
47MM

9/16/11

Please convert the following numbers to millimeters:
7”
14”
2’

9/19/11

What is the narrow slot that is produced when sawing?

9/20/11

What safety device is on the saw that stops all saw blade movement?

What should always be kept in mind when sawing odd shaped parts such as hex stock, thin parts, or tubing?

9/21/11

What are reamers used for?

How would one assure that a tap, drill, or reamer is perpendicular to the work piece?

9/22/11

What is the tap drill size for a 1 - 8 UNC 3B screw?

How many threads per in would it have?

What does the 3 stand for?

What does the B mean?

What does UNC mean?

9/23/11

What is pitch?

What is the pitch on a ¾ -10 UNC 3B nut?

9/26/11

How far would a 3/8-16 UNC nut travel in one revolution?

What is pitch?

What is Lead?

9/27/11

List 3 things that screw threads can be used for:

9/28/11

Name three tools that can be used to check the angle .06 x 45° angle on your benchwork part?

9/29/11

Atlas fieldtrip!

10/10/11

Write your decimal equivalents for all odd 8ths and 16ths?

10/11/11

What is the tap drill size for a 7/8 – 14 UNF 3B bolt hole? (use a calculator only)

10/12/11

What is the major diameter of a 7/8 – 14 UNF 3A Bolt?

What does the 14 stand for in the above mentioned thread designation?

What does the A stand for in the above mentioned thread designation?

10/13/11

What is the difference between pitch and lead? (explain in detail)

10/14/11

What is the approximate thread percentage on most Unified National threads?

10/17/11

What is a reamer used for?

How much smaller should the hole be drilled for a hand reamer up to ½”?

10/18/11

What is the lead for a 7/16-18 UNC 3A bolt?

10/19/11

How far would a double lead ¾-10 UNC 3A bolt travel in 7 revolutions?

10/20/11

What is the tap drill size for a 6-32 UNF 3B nut?

10/21/11

Please write, in order, the steps that must be done to tap a 3/8-16 UNC nut. Specify what tools to use, their sizes, and what order they run in.

10/24/11

What is a tap drill?

How does one find the tap drill size for a given bolt (give three examples including the formula as one)?

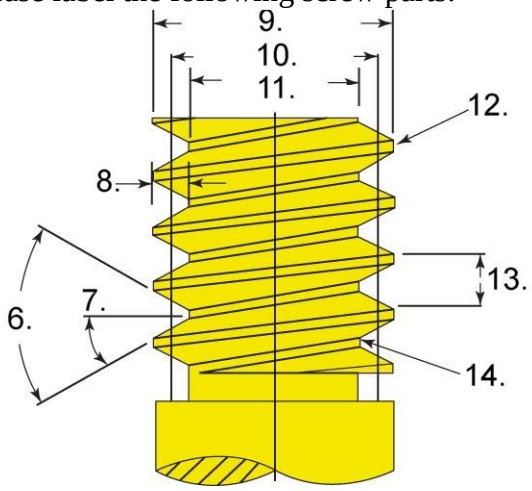
10/25/11

What is the tap drill size for a ¾-10 UNC 3B nut?

Why should the top of a tapped hole be counter sunk?

10/26/11

Please label the following screw parts:



10/27/11

Please explain what each part of the following thread designation means:
7/8-14 UNF 3B

10/28/11

What is pitch?

How can it be used to calculate the depth of a tapped hole?

10/31/11

Happy Halloween!

What is the special name for the type of jaw-type chuck that has a mechanism to move the jaws simultaneously?

The most common variation of the above chuck has how many jaws?

11/1/11

Name two material shapes that can be properly held in a three-jaw chuck.

List two advantages of using a self-centering chuck.

11/2/11

A lathe cross-slide uses a diameter reading micrometer collar. If the cross slide is advanced by .150", what depth of cut would result?

Calculate spindle RPM and machining time for cutting a 1.5" diameter 4" long at 225 SFPM using a feed rate of .004".

11/3/11

Are deeper cuts used for roughing or finishing operations?

List three safety precautions related to clothing that should be observed during lathe operation.

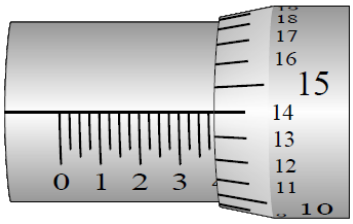
11/4/11

What two materials are most commonly used for lathe cutting tools?

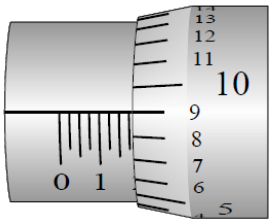
What feature of a lathe cutting tool has a direct effect on surface finish?

11/9/11

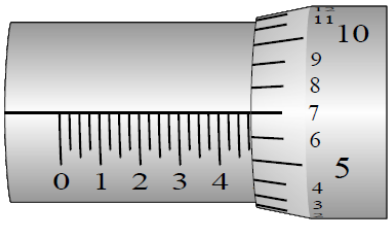
Please make readings of the following micrometers and place only the answer on your daily questions sheet.



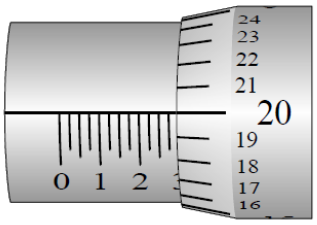
_____



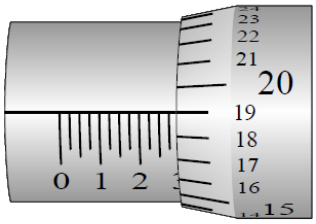
_____



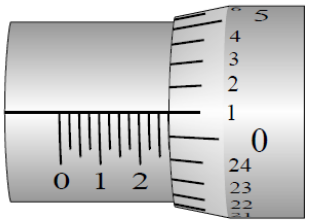
_____



_____



_____



_____

11/10/11

What RPM should one run a 3” diameter 1018 CRS (cold rolled steel) shaft?

What feed rate in IPR (inches per revolution) should one <u>rough turn</u> the above mentioned shaft?

What feed rate in IPR (inches per revolution) should one <u>finish turn</u> the above mentioned shaft?

11/11/11

Define facing.

Define turning.

Define rough turning.

Define finish turning.

11/14/11

In what operation should the tool bit be on center?

11/15/11

Using only a calculator, find the tap drill size for the following threads:
7/8-14 UNF 2B
3/4-10 UNC 3B
3/8-16 UNC 1B

11/16/11

What is the minimum depth that a hole should be tapped to maintain its maximum strength?

11/17/11

Of what use is the tailstock of a lathe?

What is the compound rest?

11/18/11

No Question! Fieldtrip to Whitworth Tool and Stamping!

11/21/11

What RPM should one run a 1.625" diameter 1018 CRS (cold rolled steel) shaft?

What feed rate in IPR (inches per revolution) should one rough turn the above mentioned shaft?

What feed rate in IPR (inches per revolution) should one finish turn the above mentioned shaft?

11/22/11

No question! Happy Thanksgiving! Gobble! Gobble!

11/28/11

Explain how to center a part using a 4-jaw chuck. Be sure to explain how to make the part run true on each end.

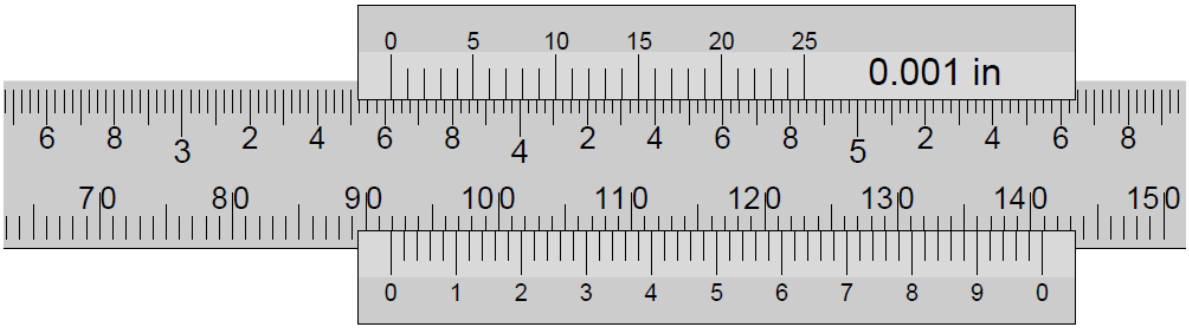
11/29/11

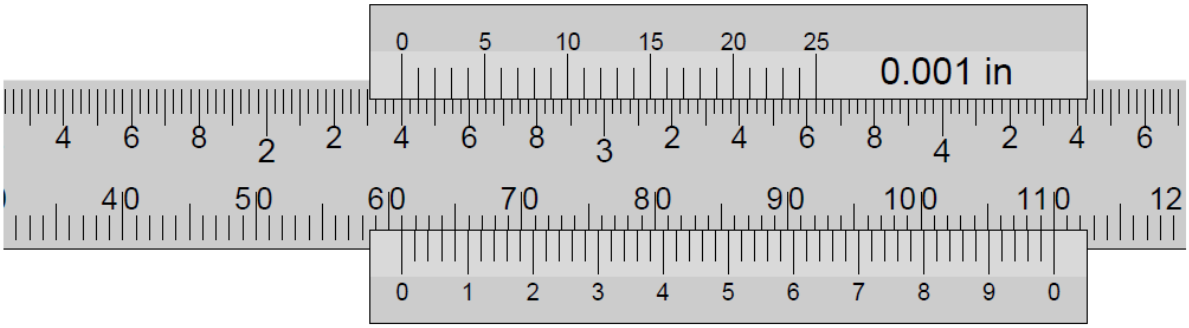
How much should be left on any outside diameters before finishing?

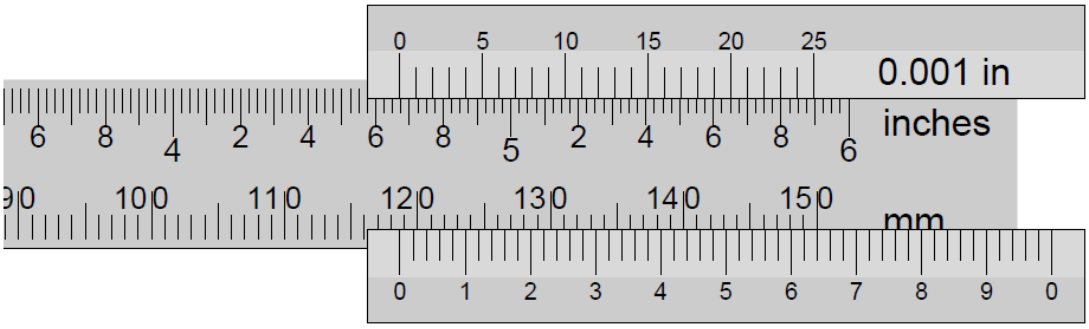
Why should the entire part be roughed in before finish turning?

11/30/11

What is the reading on each caliper? Measure to the nearest 0.001 inch.







12/1/11

What is the magic number to convert millimeters to inches?

Please convert the following numbers to inches:
30MM
200MM
35MM

12/2/11

What is the smallest graduation on an inch micrometer with a vernier scale?

What is calibration and why is it important?

12/5/11

What type of fixed gage can be used to check hole diameters?

What fixed gage can be used to check a threaded hole?

What is the name of the process of attaching gage blocks to each other?

12/6/11

No questions! NIMS Review!

12/7/11

What would the gage block stack be of a 22° angle on a 5 inch sine bar?

What would be the best blocks to use to get this height from an 81 piece gage block set?

12/8/11

What is a sampling?

What is a control chart?

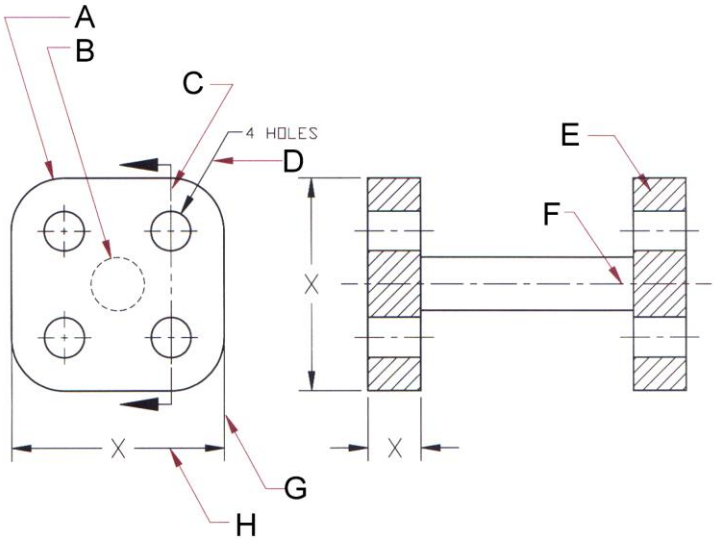
What good is quality control?

12/9/11

What sizes of gage pins would a machinist need for a dimension of 5/32 ± 1/64th inches for a go/no go gage setup (rounded to three places)?

12/12/11

Please label the following line types:



12/13/11

Using only a calculator, find the tap drill size for the following threads:
7/8-20 UNF 2B
3/8-18 UNC 3B

12/14/11 to 1/4/12

No Question! Merry Christmas!

1/4/2012

What does the term “knurl” mean in the world of machining?

For what purpose is a knurl used?

1/5/2012

Please sketch a correctly center drilled hole.

1/6/2012

Please write your decimal equivalents for all odd 1/8ths and 1/16ths fractions.

You may want to start studying for your 1/32ths!

1/9/12

What is the formula used to find RPM for the lathe?

What is the definition of surface feet per minute?

1/10/12

What RPM should one run a ¼” diameter center drill?

What is the included angle on a center drill?

1/11/12

Please explain how to be sure the tailstock is aligned with the headstock if close tolerance work is to be done.

1/12/12

What does it mean to hold work between centers?

What are some advantages to holding work between centers?

1/13/12

What two auxiliary devices can be used to stabilize long, slender workpieces for turning operations?

What device is used to transfer motion from the chuck or faceplate when turning between centers?

1/17/12

How would one machine a short angle on the exterior of a cylindrical part? (List two ways)

1/18/12 (finish reading Section 5 Unit 3 starts on page385. Do the 25 question on page413-414)

List and explain the steps one would take to machine a shaft with three journals ad square shoulders such as the one you first ran.

What is a journal on a shaft?

What is a shoulder?

List three types of shoulders.

1/19/12 (questions due)

If machining a long section of steel and it begins to chatter, what can be done to minimize this problem?

1/20/12

What is the tap drill size for a 7/16-20 UNF 3B thread?

What part of the above thread designation tells that this is an external thread?

How far would a bolt with this size thread move in 6 turns?

1/23/12

Determine the minor diameter limits for the following threads using the Machinery's Handbook:

½-20 UNC 2B

¾-16 UNF 3B

1-8 UNC 2B

¼-12 UNF 3B

1/24/12

What is the name of the tool that is used to align the threading tool perpendicular to the machine axis and is used as a template for grinding the tool?

1/25/12

Define the swing and the bed length of a lathe.

Why is it important to know what these are?

1/26/12

What type of standard taper can be found in the tailstock on most lathes?

1/27/12

What part of the lathe regulates the feed rate of the cutting tool?

1/30/12

What is the feed on a lathe designated in?

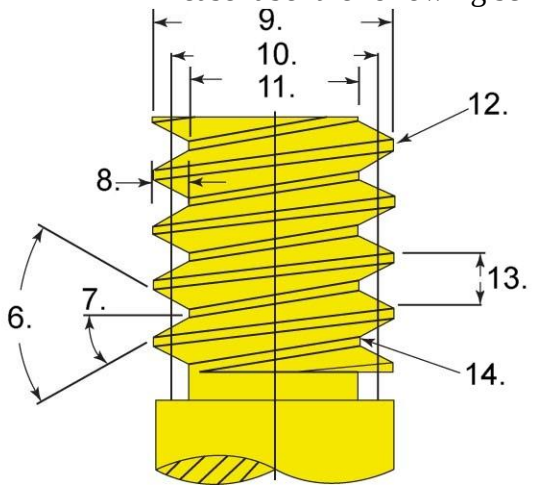
1/31/12

What is the name of the operation that is used to remove the finished end portion of a part in the lathe?

Name three things that threads can be used for.

2/1/12

Please label the following screw parts:



2/2/12

When setting a thread up for the first cut, we just scratch the surface. How do we know it the machine is set up in the correct gearing? (include the tools used)

2/3/12

What is the name of the device that meshes with the lead screw and is used to tell when to engage the half nuts so that the threading tool will travel down the original thread path?

2/6/12

What is the formula for the largest wire size that may be use for a given thread?

What is the formula for the Smallest wire size that may be use for a given thread?

What is the formula for the measurement over wires for the three wire method?

Please calculate the largest and smallest wires that may be used for a 7/8-14 UNF thread.

Please calculate the measurement over Ø.032 wires for a ½-20 UNF thread.

2/7/12

What is the name for the rotating device that transmits power to the carriage for thread-cutting motion?

Why must we set the compound at 29 1/2 °?

2/8/12

Name the device used to track the timing of half-nut lever engagement.

Why should the depth of cut be reduced for each pass as the thread is cut deeper?

2/9/12

Determine the approximate compound-rest in-feed for cutting a 1½-12 UNF 2A thread.

What type of thread is machined on a tapered diameter and is used to create leak-proof joints?

2/10/12

List two applications of Acme threads.

How many classes of fit are there in the Unified National system?

2/13/12

What is the formula for the largest wire that may be used for the three wire method?

What is the formula for the smallest wire that may be used for the three wire method?

What is the formula for the three wire method when you need the upper and lower limits for the pitch diameter? (Page 429 in your text)

Using the *Machinery's Handbook*, calculate the upper and lower limits for the pitch diameter on a 7/8-9 UNC 3A thread when using the three wire method. You will need to calculate the wire size to use as well.

2/14/12

Using the *Machinery's Handbook*, find the upper and lower pitch diameter limits for a ¾-10 UNC 3A thread.

2/15/12

According to the *Machinery's Handbook*, what is the counter bore diameter and depth for a one half inch socket head cap screw.

2/16/12

Using the *Machinery's Handbook*, find the upper and lower bore or hole diameter limits for a 1 ½-6 3A thread.

2/21/12

Using the *Machinery's Handbook*, calculate the upper and lower limits for the pitch diameter on a 7/8-14 UNF 3A thread when using the three wire method. You will need to calculate the wire size to use as well.

2/22/12

Using the *Machinery's Handbook*, calculate the upper and lower limits for the pitch diameter on a 1 ½-6 3A thread when using the three wire method. You will need to calculate the wire size to use as well.

2/23/12

Using the *Machinery's Handbook*, calculate the upper and lower limits for the pitch diameter on a 3/4-20 UNEF 2A thread when using the three wire method. You will need to calculate the wire size to use as well.

2/24/12

Please try these without your text or notes. If you cannot, then peek if needed.

What is the formula for the largest wire that may be used for the three wire method?

What is the formula for the smallest wire that may be used for the three wire method?

What is the formula for the three wire method when you need the upper and lower limits for the pitch diameter? (Page 429 in your text)

Using the *Machinery's Handbook*, calculate the upper and lower limits for the pitch diameter on a 1 5/8 -10 UNS 2A thread when using the three wire method. You will need to calculate the wire size to use as well.

Available wires:

.185	**.270**
.063	**.081**
.032	**.072**
.018	**.024**
.029	**.040**
.055	**.045**
.092	**.108**
.143	**.120**

2/27/12

Find the smallest and largest wire size that can be used for the given thread. Use the smallest <u>available</u> wires and find the upper and lower measurement over those wires for the given thread. Also find the double depth of each thread.

Available wires:

.185	**.270**
.063	**.081**
.032	**.072**
.018	**.024**
.029	**.040**
.055	**.045**
.092	**.108**
.143	**.120**

1 3/8-12 UNF 1A
Smallest _____
Largest _____
Wires used to calculate M _____
Measurement over wires Upper Limit _____
Lower Limit _____
Double Depth of thread _____
About how far would the compound rest be moved in at 29.5° for this thread?_____

2/28/12

What part of the vertical milling machine allows workpieces to be raised and lowered?

2/29/12

What is the name of the taper found in most modern vertical milling machines?

What is the quill used for on a vertical milling machine?

3/1/12

What does the acronym DRO stand for on a milling machine or lathe?

What is a benefit of using a DRO instead of micrometer collars for positioning on a vertical milling machine?

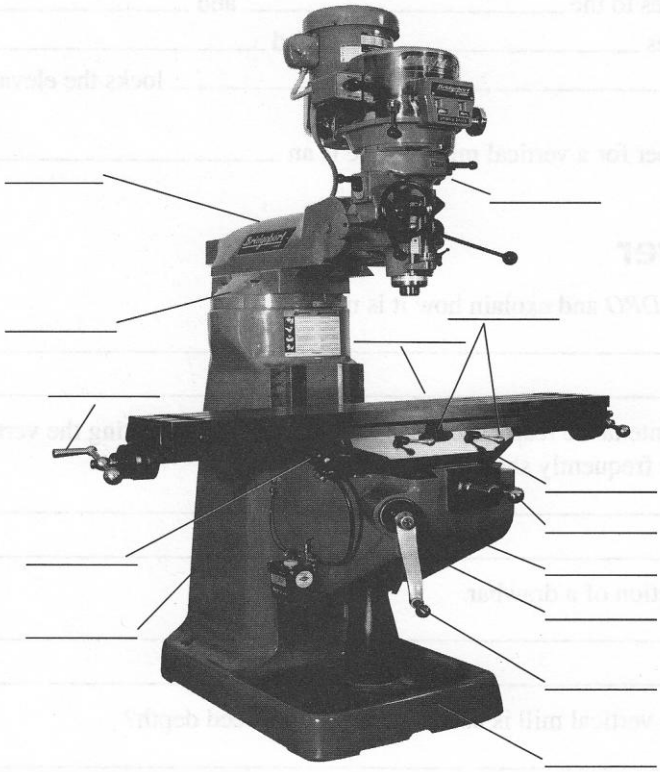
3/2/12

What part of the vertical milling machine holds the x-axis and slides directly on top of the knee?

3/5/12

Using the appropriate letter, label the parts of the vertical milling machine in the photo/illustration.

a. Knee
b. Saddle
c. Turret
d. Head
e. Table locks
f. Base
g. Ram
h. Table crank
i. Table
j. Saddle crank
k. Knee crank lock
l. Saddle lock
m. Column
n. Knee elevating crank



3/6/12

What is the name of the device that passes through the spindle or a vertical milling machine and is used to secure tool-holding devices in the spindle?

What is the name of the device that is used to stop spindle rotation and to lock the spindle to prevent rotation?

Describe the x-axis and y-axis movement. What direction does each move? What direction (cw or ccw) should the handle be cranked to move them away from the operator?

What is the standard taper for most vertical milling machines?

3/7/12

When should safety glasses be worn in the shop?

What may happen if oily rags are piled up and no stored in an approved safety container?

What causes most shop accidents?

Why should we not clean our machines with compressed air?

3/8/12

What should be used to remove chips and shavings from the machines?

What should be done to prevent the part from moving around on the table?

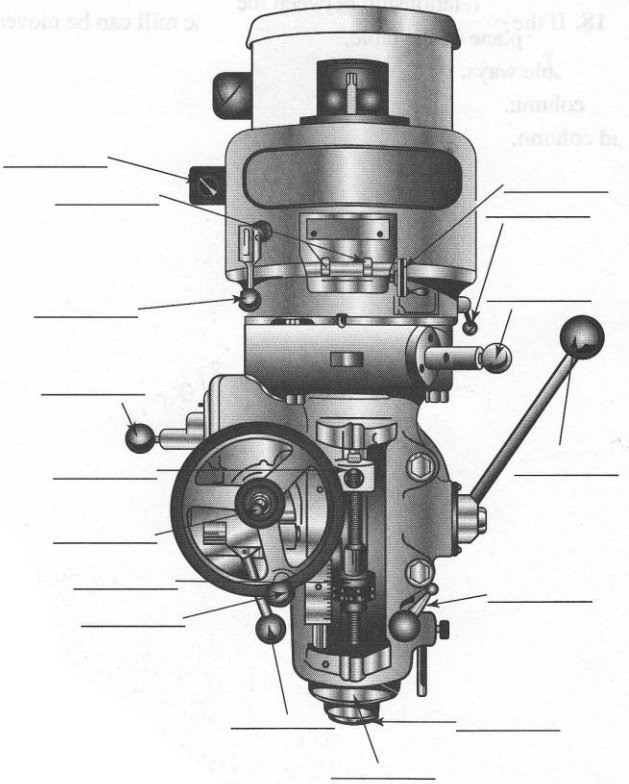
What should be done before making measurements and adjustments?

3/9/12

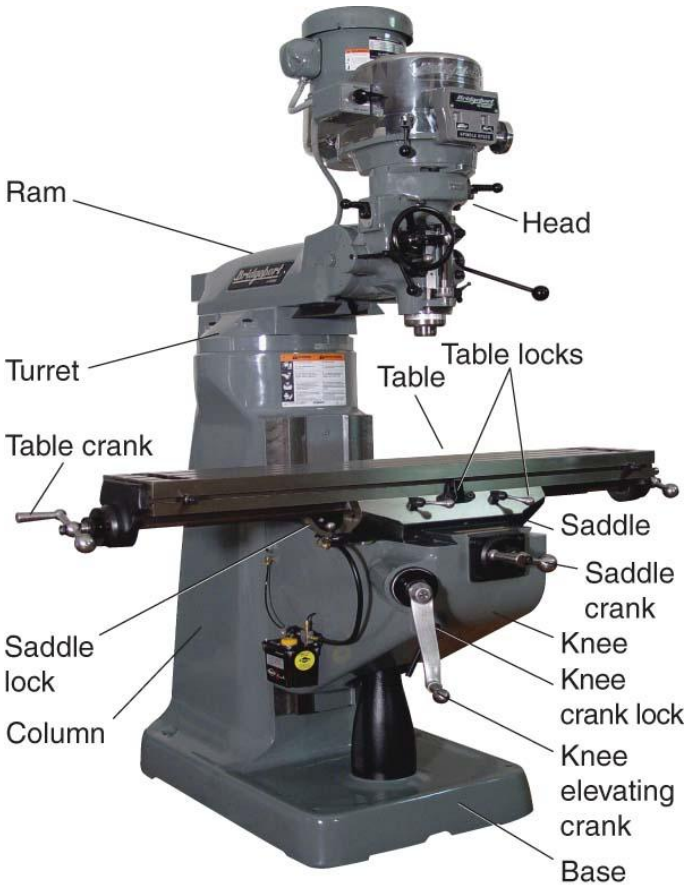
What is Lock-out Tag-out?

Label the parts of the vertical milling machine head in the photo/illustration.

a. Quill feed selector knob
b. Micrometer adjusting knob
c. High/low range switch
d. Feed control lever
e. Variable speed dial
f. Speed change handwheel
g. Spindle
h. Quill
i. Spindle brake
j. Power feed transmission engagement crank
k. Quill stop
l. High/neutral/low lever
m. Manual feed handwheel
n. Feed reverse knob
o. Quill lock
p. Quill feed handle



Review for test:



3/13/12

Using a cutting speed of 60 SFM, what RPM would one run a ¾" HSS end mill?

What does the acronym SFM in the above question stand for?

What does the acronym HSS in the above question stand for?

3/14/12

No Question! Test review and test today!

3/15/12

What RPM should one run a lathe using a cemented carbide turning tool on a 2" diameter A2 shaft? Use the slower of the two numbers for the SFM on the chart.

What factors determine how fast to run an end mill on a milling machine?

Where can one find the SFM for an inserted tooth cutter of any type?

3/16/12

Compare SFM to RPM.

3/19/12

In your own words, what is a work holding attachment or devise?

3/20/12

Most cutters that we use are made from what two materials?

What is a hold-down clamp?

What are the major parts that are used in a hold-down clamp set?

3/21/12

How would one hold odd shaped work that cannot be held in a vise or clamped to the machine table?

3/22/12

What part of a milling machine holds the tooling and spins?

What type of milling cutter can be fed into the work like a drill?

3/23/12

Compare a roughing end mill and a finishing end mill? (explain your answer)

3/26/12

Please sketch the cross section of a roughing end-mill. How does it differ from a finishing end-mill?

3/27/12

Please commit the following formulas to memory:

RPM= (CS x 3.82)/Ø

FEED in inches per minute=RPM x # of teeth x chip load

3/28/12

What RPM would one run a 4-flute 3/8 HSS end-mill with a cutting speed of 70 SFM?

If that same end-mill had a recommended chip load of .001 per tooth, what feed would it need to run?

3/29/12

What is the official name of a single point face mill?

4/9/12 Review questions this week:

What is the smallest graduation on an inch micrometer with a vernier scale?

What is calibration and why is it important?

4/10/12

When turning a part from start to finish, what order of operations should be followed?
Start with:

1. Facing
2. Center drill
3. ……
4. ……
5. ……

4/16/12

What is semi-precision measurement?

What is comparison measurement?

List the parts of a combination set.

4/17/12

Using the chart on page 488 of your text, what is the recommended cutting speed for die steel?

What is the FPT for a ½" end mill?

What would the feed per revolution be if this end mill had 4 flutes?

4/18/12

List the steps needed to square a block on a milling machine.

4/19/12

Compare and contrast FPT and IPR

4/20/12

Most cutters that we use are made from what two materials?

Math

Integers

Which of the following is an integer?

$-\frac{7}{2}, -0.1, 12\%, 3, \pi$

Math

Digits

How many distinct digits are in the number 321,321,000?

Math

Consecutive Numbers

What is the next number in the following sequence?

39, 42, 45, 48, ...

Math

Counting Consecutive Integers

How many integers are there from 13 through 31, inclusive?

Math

PEMDAS

$9 - 2 \bullet (5 - 3)^2 + 6 \div 3 = ?$

Math

Sums, Differences, and Products

What is the positive difference between the sum of 4 and 5 and the product of 4 and 5?

Math

Factors

List all the factors of 18.

Math

Remainders

What is the remainder when 487 is divided by 5?

s are the integers 0 [redacted] hrough 9. Integers greater than 9
more than one digit. The number 321,321,000 has 9
, but only 4 *distinct* [redacted] different) digits: 3, 2, 1, and 0.

An **integer** is a multiple of 1. Integers include negative whole numbers and zero.

)unt consecutive inte[redacted]gers, subtract the smallest from
argest and add 1. To count the integers from 13 through
subtract: 31 – 13 = 1[redacted] 8. Then add 1: 18 + 1 = 19.

Consecutive numbers are numbers of a certain type, presented in order without skipping any. The numbers 39, 42, 45, and 48 are consecutive multiples of 3. Each number in the sequence is 3 more than the previous number. The next number would be 48 + 3 = 51.

sum is the result of [redacted]ddition. The **difference** is the result
ubtraction. The **produ[redacted]ct** is the result of multiplication.
sum of 4 and 5 is 9. The product of 4 and 5 is 20. The
tive difference betwe[redacted]n 9 and 20 is 11.

When performing multiple operations, remember **PEMDAS,** which means **Parentheses** first, then **Exponents,** then **Multiplication/Division** (left to right), and lastly **Addition/Subtraction** (left to right). In the expression $9 - 2 \bullet (5 - 3)^2 + 6 \div 3$, begin with the parentheses: $(5 - 3) = 2$. Then do the exponent: $2^2 = 4$. Now the expression is: $9 - 2 \bullet 4 + 6 \div 3$. Next do the multiplication and division to get: $9 - 8 + 2$, which equals 3.

remainder is the nu[redacted]mber left over after division. 487
more than 485, whi[redacted]ch is a multiple of 5, so when 487
vided by 5, the rem[redacted]ainder will be 2.

The **factors** of integer n are the positive integers that divide into n with no remainder. The **multiples** of n are the integers that n divides into with no remainder. 3 is a factor of 6, and 18 is a multiple of 6. All the factors of 18 are listed below.

Math

Least Common Multiples

What is the least common multiple of 12 and 15?

Math

Greatest Common Factors

What is the greatest common factor of 36 and 48?

Math

Prime Numbers

What is the greatest prime number less than 37?

Math

Multiples of 3 and 9

Which of the following is a multiple of 3 but not a multiple of 9?

109, 117, 260, 361, 459, 957, 1001

Math

Multiples of 2 and 4

Which of the following is a multiple of 2 but not a multiple of 4?

124, 352, 483, 562, 708, 984

Math

Adding and Subtracting Fractions

$$\frac{2}{15} + \frac{3}{10} = ?$$

Math

Multiplying Fractions

$$\frac{5}{7} \cdot \frac{3}{4} = ?$$

Math

Dividing Fractions

$$\frac{1}{2} \div \frac{3}{5} = ?$$

Arithmetic

To find the **greatest common factor,** break down both numbers into their prime factorizations and take all the prime factors they have in common. $36 = 2 \cdot 2 \cdot 3 \cdot 3$, and $48 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$. What they have in common is two 2s and one 3, so the GCF is $2 \cdot 2 \cdot 3 = 12$.

KAPLAN

12

Arithmetic

To find the **least common multiple,** check out the multiples of the larger number until you find one that's also a multiple of the smaller. Taking the multiples of 15: 15 is not divisible by 12; 30 is not; 45 is not. But the next multiple of 15, 60, *is* divisible by 12, so it's the LCM.

KAPLAN

60

Arithmetic

An integer is divisible by 3 if the sum of its digits is divisible by 3. An integer is divisible by 9 if the sum of its digits is divisible by 9. The sum of the digits in 957 is 21, which is divisible by 3 but not by 9, so 957 is divisible by 3 but not by 9.

KAPLAN

957

Arithmetic

A **prime number** is a positive integer that is divisible only by 1 and itself. The smallest prime number, and the only even prime number, is 2.

KAPLAN

31

Arithmetic

To add or subtract fractions, first find a common denominator, then add or subtract the numerators.

$$\frac{2}{15} + \frac{3}{10}$$
$$= \frac{4}{30} + \frac{9}{30}$$
$$= \frac{4+9}{30}$$
$$= \frac{13}{30}$$

KAPLAN

$\frac{13}{30}$

Arithmetic

An integer is divisible by 2 (even) if the last digit is even. An integer is divisible by 4 if the last two digits make a multiple of 4. The last digit of 562 is 2, which is even, so 562 is a multiple of 2. The last two digits make 62, which is *not* divisible by 4, so 562 is *not* divisible by 4.

KAPLAN

562

Arithmetic

To divide fractions, multiply one by the reciprocal of the other.

$$\frac{1}{2} \div \frac{3}{5}$$
$$= \frac{1}{2} \cdot \frac{5}{3}$$
$$= \frac{1 \cdot 5}{2 \cdot 3}$$
$$= \frac{5}{6}$$

KAPLAN

$\frac{5}{6}$

Arithmetic

To multiply fractions, multiply the numerators and multiply the denominators.

$$\frac{5}{7} \cdot \frac{3}{4}$$
$$= \frac{5 \cdot 3}{7 \cdot 4}$$
$$= \frac{15}{28}$$

KAPLAN

$\frac{15}{28}$

Math

Reciprocals

What is the reciprocal of $\frac{3}{7}$?

Math

Comparing Fractions

Which is greater: $\frac{3}{4}$ or $\frac{5}{7}$?

Math

Mixed Numbers and Improper Fractions

Express $7\frac{1}{3}$ as an improper fraction.

Math

Converting Fractions to Decimals

Express $\frac{5}{8}$ as a decimal.

Math

Percents

Express 32% as a fraction in lowest terms.

Math

Percent Increases

What number is 25% more than 40?

Math

Converting Tenths

Express $\frac{3}{10}$ as a percent.

Math

Converting Fifths

Express $\frac{2}{5}$ as a decimal.

Arithmetic

One way to compare fractions is to express them with a common denominator. $\frac{3}{4} = \frac{21}{28}$ and $\frac{5}{7} = \frac{20}{28}$. $\frac{21}{28}$ is greater than $\frac{20}{28}$, so $\frac{3}{4}$ is greater than $\frac{5}{7}$. Another way to compare fractions is to convert them both to decimals. (Use your calculator.) $\frac{3}{4}$ converts to 0.75, and $\frac{5}{7}$ converts to approximately 0.714.

KAPLAN

$\frac{3}{4}$

Arithmetic

To find the **reciprocal** of a fraction, switch the numerator and the denominator. The reciprocal of $\frac{3}{7}$ is $\frac{7}{3}$. The reciprocal of 5 is $\frac{1}{5}$. The product of reciprocals is 1.

KAPLAN

$\frac{7}{3}$

Arithmetic

To convert a fraction to a decimal, divide the numerator by the denominator. (Use your calculator.) To convert $\frac{5}{8}$, divide 5 by 8, yielding 0.625.

KAPLAN

0.625

Arithmetic

To convert a mixed number to an improper fraction, multiply the whole number part by the denominator, then add the numerator. The result is the new numerator (over the same denominator). To convert $7\frac{1}{3}$, first multiply 7 by 3, then add 1, to get the new numerator of 22. Put that over the same denominator, 3, to get $\frac{22}{3}$.

KAPLAN

$\frac{22}{3}$

Arithmetic

To increase a number by a percent, add the percent to 100%, convert to a decimal, and multiply. To increase 40 by 25%, add 25% to 100%, convert 125% to 1.25, and multiply by 40. $1.25 \cdot 40 = 50$.

If you prefer working with percents as fractions, you could solve this question by converting 25% to $\frac{25}{100} = \frac{1}{4}$, and adding $\frac{1}{4}$ of 40 to 40: $\left(\frac{1}{4}\right)\left(40\right) = 10$

$40 + 10 = 50$

KAPLAN

50

Arithmetic

A **percent** is a fraction with an implied denominator of 100. 32% means $\frac{32}{100}$ which reduces to $\frac{8}{25}$.

KAPLAN

$\frac{8}{25}$

Arithmetic

When converting, remember that $\frac{1}{5} = 0.2 = 20\%$. $\frac{2}{5}$ is twice that much, so it equals 0.4.

KAPLAN

0.4

Arithmetic

When converting, remember that $\frac{1}{10} = 0.1 = 10\%$. $\frac{3}{10}$ is 3 times that, so it equals 30%.

KAPLAN

30%

Math

Converting Fourths

Express 75% as a fraction in lowest terms.

Math

Converting Thirds

Express $\frac{2}{3}$ as a percent.

Math

Converting Eighths

Express $37\frac{1}{2}\%$ as a fraction in lowest terms.

Math

Average

What is the average of 12, 15, 23, 40, and 40?

Math

Using Averages to Find Sums

The average of 10 numbers is 50. What is the sum of the 10 numbers?

Math

Using Averages to Find Missing Numbers

The average of 4 numbers is 7. If 3 of the numbers are 3, 5, and 8, what is the fourth number?

Math

Averages of Consecutive Numbers

What is the average of all the integers from 13 through 77, inclusive?

Math

Median

What is the median of 12, 15, 23, 40, and 40?

When converting, remember that $\frac{1}{3} = 0.333... = 33\frac{1}{3}\%$. $\frac{2}{3}$ is twice that, so it equals $66\frac{2}{3}\%$.

$66\frac{2}{3}\%$

When converting, remember that $\frac{1}{4} = 0.25 = 25\%$. 75% is 3 times that, so it equals $\frac{3}{4}$.

$\frac{3}{4}$

To find the **average** of a set of numbers, add them up and divide by the number of numbers.

$$\text{Average} = \frac{\text{Sum of the terms}}{\text{Number of the terms}}$$

To find the average of the 5 numbers 12, 15, 23, 40, and 40, first add them up: 12 + 15 + 23 + 40 + 40 = 130. Then divide the sum by 5: 130 ÷ 5 = 26.

26

When converting, remember that $\frac{1}{8} = 0.125 = 12\frac{1}{2}\%$. $37\frac{1}{2}\%$ is 3 times that, so it equals $\frac{3}{8}$.

$\frac{3}{8}$

To find a missing number when you're given the average, use the sum. If the average of 4 numbers is 7, then the sum of those 4 numbers is 4 • 7, or 28. Three of the numbers (3, 5, and 8) add up to 16 of that 28, which leaves 12 for the fourth number.

12

Sum = (Average) • (Number of terms). If the average of 10 numbers is 50, then they add up to 10 • 50, or 500.

500

The **median** is the middle value. The median of 12, 15, 23, 40, and 40 is 23 because it's the middle value: two numbers are smaller and two numbers are bigger. If there's an even number of values, the median is halfway between the two middle values. For instance, the median of 1, 2, 3, and 4 would be 2.5.

23

To find the average of evenly spaced numbers, just average the smallest and the largest. The average of all the integers from 13 through 77 is the same as the average of 13 and 77.

$$\frac{13 + 77}{2} = \frac{90}{2} = 45$$

45

Math

Mode

What is the mode of 12, 15, 23, 40, and 40?

Math

Ratios

A basket contains 12 apples and 20 oranges. What is the ratio of oranges to apples?

Math

Using Ratios to Find Numbers

In a group of 18 people, the ratio of men to women is 1:2. How many women are there?

Math

Distance, Rate, and Time

How many hours are needed to travel 220 miles at 55 miles per hour?

Math

Average Rates

Alex drove 120 miles at 40 miles per hour and another 120 miles at 60 miles per hour. What was Alex's average speed for the whole 240 miles?

Math

Probability

A box contains 2 white balls, 6 red balls, and 8 green balls. If a ball is chosen at random, what is the probability that the ball is green?

Math

Exponents

$7^3 = ?$

Math

Multiplying and Dividing Powers

$x^3 \cdot x^4 = ?$

Arithmetic

To find a **ratio,** put the number associated with the word "of" on top and the quantity associated with the word "to" on the bottom and reduce. The ratio of 20 oranges to 12 apples is $\frac{20}{12}$, which reduces to $\frac{5}{3}$.

KAPLAN

$\frac{5}{3}$

Arithmetic

The **mode** is the number that appears the most often. The mode of 12, 15, 23, 40, and 40 is 40 because it appears more often than any other number. If two numbers appear equally often, they are *both* modes.

KAPLAN

40

Algebra

Distance = Rate • Time

220 miles = (55 miles per hour)(x hours)

$220 = 55x$

$$x = \frac{220}{55} = 4$$

KAPLAN

4

Arithmetic

If the parts add up to the whole, a part-to-part ratio can be turned into 2 part-to-whole ratios by putting each number in the original ratio over the sum of the numbers. If the ratio of men to women is 1 to 2, then the men-to-people ratio is $\frac{1}{1+2} = \frac{1}{3}$ and the women-to-people ratio is $\frac{2}{1+2} = \frac{2}{3}$. Of the 18 people, $\frac{2}{3}$ are women.

KAPLAN

12

Logic & Data Analysis

$$\textbf{Probability} = \frac{\textbf{\# of desired outcomes}}{\textbf{total \# of possible outcomes}}$$

If 8 of 16 balls are green, the probability of choosing a green ball is $\frac{8}{16}$ or $\frac{1}{2}$.

KAPLAN

$\frac{1}{2}$

Algebra

$$\textbf{Average } A \textbf{ per } B = \frac{\textbf{Total } A}{\textbf{Total } B}. \quad \text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

To find the average speed for 120 miles at 40 mph and 120 miles at 60 mph, don't just average the two speeds. First figure out the total distance and the total time. The total distance is 120 + 120 = 240 miles. The times are 3 hours for the first leg and 2 hours for the second leg, or 5 hours total.

The average speed, then, is $\frac{240}{5}$ = 48 miles per hour.

KAPLAN

48 mph

Algebra

To multiply powers, add the exponents:

$x^3 \cdot x^4 = x^{(3+4)} = x^7$.

To divide powers, subtract the exponents:

$y^{13} \div y^8 = y^{(13-8)} = y^5$.

KAPLAN

x^7

Algebra

$7^3 = 7 \cdot 7 \cdot 7 = 343$

KAPLAN

343

Math

Powers of Fractions

Which is larger: $\frac{2}{3}$ or $\left(\frac{2}{3}\right)^2$?

Math

Powers of Negatives

$(-1)^{57} = ?$

Math

Raising Powers to Powers

$(x^3)^4 = ?$

Math

Radicals

$\sqrt{16} = ?$

Math

Multiplying and Dividing Radicals

$\frac{\sqrt{6}}{\sqrt{3}} = ?$

Math

Square Roots of Fractions

$\sqrt{\frac{4}{9}} = ?$

Math

Combining Like Terms

$2a + 3a = ?$

Math

Adding and Subtracting Polynomials

$(3x^2 + 5x + 7) - (x^2 + 12) = ?$

Algebra

A negative number raised to an *even* power yields a *positive* result. A negative number raised to an *odd* power yields a *negative* result. -1 to an even power is 1; -1 to an odd power is -1.

KAPLAN

-1

Algebra

Raising a fraction between 0 and 1 to a power yields a number smaller than the original.

$$\left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

KAPLAN

$\frac{2}{3}$

Algebra

$\sqrt{n}$ is defined as the non-negative number which when squared equals n. There are two numbers that equal 16 when squared: 4 and -4. By definition, however, $\sqrt{16}$ means the *non-negative* square root: 4.

KAPLAN

4

Algebra

To raise a power to a power, multiply the exponents.

$(x^3)^4 = x^{(3 \cdot 4)} = x^{12}$

KAPLAN

x^{12}

Algebra

To take the square root of a fraction, take the square roots of the numerator and denominator separately.

$$\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$$

KAPLAN

$\frac{2}{3}$

Algebra

The product of square roots is equal to the square root of the product: $\sqrt{3} \cdot \sqrt{5} = \sqrt{3 \cdot 5} = \sqrt{15}$. The quotient of square roots is equal to the square root of the quotient.

$$\frac{\sqrt{6}}{\sqrt{3}} = \sqrt{\frac{6}{3}} = \sqrt{2}$$

KAPLAN

$\sqrt{2}$

Algebra

To add or subtract polynomials, combine like terms.

$$\begin{aligned}&(3x^2 + 5x + 7) - (x^2 + 12)\\ &= (3x^2 - x^2) + 5x + (7 - 12)\\ &= 2x^2 + 5x - 5\end{aligned}$$

KAPLAN

$2x^2 + 5x - 5$

Algebra

To combine like terms, keep the variable part unchanged while adding or subtracting the coefficients.

$$\begin{aligned}&2a + 3a\\ &= (2 + 3)a\\ &= 5a\end{aligned}$$

KAPLAN

$5a$

Math

Multiplying Monomials

$2a \cdot 3a = ?$

Math

Multiplying Binomials

$(x + 3)(x + 4) = ?$

Math

Factoring Out Common Factors

Factor: $3x^3 + 12x^2 - 6x$

Math

Factoring Products of Binomials

Factor: $x^2 - 5x + 6$

Math

Factoring Differences Between Squares

Factor: $x^2 - 9$

Math

Evaluating Algebraic Expressions

What is the value of $x^2 + 5x - 6$ when $x = -2$?

Math

Solving Linear Equations

If $5x - 12 = -2x + 9$, what is the value of x?

Math

Solving for One Variable in Terms of Another

If $3x - 10y = -5x + 6y$, what is the value of x in terms of y?

Algebra

To multiply binomials, use **FOIL**. To multiply $(x + 3)$ by $(x + 4)$, first multiply the **F**irst terms: $x \cdot x = x^2$. Next the **O**uter terms: $x \cdot 4 = 4x$. Then the **I**nner terms: $3 \cdot x = 3x$. And finally the **L**ast terms: $3 \cdot 4 = 12$. Then add and combine like terms: $x^2 + 4x + 3x + 12 = x^2 + 7x + 12$.

KAPLAN

$x^2 + 7x + 12$

Algebra

To multiply monomials, multiply the coefficients and the variables separately.

$2a \cdot 3a$
$= (2 \cdot 3)(a \cdot a)$
$= 6a^2$

KAPLAN

$6a^2$

Algebra

To factor a quadratic expression, think about what binomials you could use **FOIL** on to get that quadratic expression. To factor $x^2 - 5x + 6$, think about what **F**irst terms will produce x^2, what **L**ast terms will produce $+6$, and what **O**uter and **I**nner terms will produce $-5x$. Some common sense and a little trial and error lead you to $(x - 2)(x - 3)$.

KAPLAN

$(x - 2)(x - 3)$

Algebra

A factor common to all terms of a polynomial can be factored out. All three terms in the polynomial $3x^3 + 12x^2 - 6x$ contain a factor of $3x$. Pulling out the common factor yields $3x(x^2 + 4x - 2)$.

KAPLAN

$3x(x^2 + 4x - 2)$

Algebra

To evaluate an algebraic expression, plug in the given values for the unknowns and calculate according to **PEMDAS**. To find the value of $x^2 + 5x - 6$ when $x = -2$, plug in -2 for x.

$(-2)^2 + 5(-2) - 6$
$= 4 + (-10) - 6$
$= -12$

KAPLAN

-12

Algebra

One of the testmaker's favorite factorables is the **difference between squares.** An expression in the form $a^2 - b^2$ factors to $(a - b)(a + b)$. $x^2 - 9$, then, factors to $(x - 3)(x + 3)$.

KAPLAN

$(x - 3)(x + 3)$

Algebra

To solve an equation for one variable in terms of another means to isolate the variable on one side of the equation, leaving an expression containing the other variable on the other side of the equation. To solve the equation $3x - 10y = -5x + 6y$ for x in terms of y, isolate x.

$3x - 10y = -5x + 6y$
$3x + 5x = 6y + 10y$
$8x = 16y$
$x = 2y$

KAPLAN

$2y$

Algebra

To solve an equation, do whatever is necessary to both sides to isolate the variable. To solve the equation $5x - 12 = -2x + 9$, first get all the xs on one side by adding $2x$ to both sides: $7x - 12 = 9$. Then add 12 to both sides: $7x = 21$. Then divide both sides by 7 to get $x = 3$.

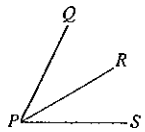
KAPLAN

3

Math

Bisectors

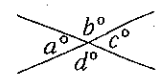
PR bisects angle *QPS*. If the measure of angle *QPS* is 60 degrees, what is the measure of angle *RPS*?



Math

Adjacent Angles

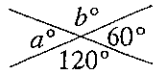
$a + b = ?$



Math

Vertical Angles

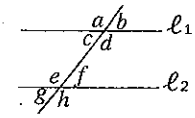
$a = ?$



Math

Parallel Lines and Transversals

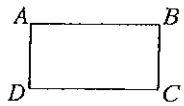
If ℓ_1 is parallel to ℓ_2, what 3 angles are equal to angle *a*?



Math

Rectangles

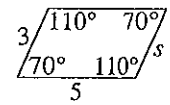
ABCD is a rectangle. What is the measure of angle *ABC*?



Math

Parallelograms

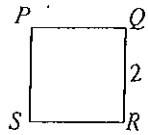
$s = ?$



Math

Squares

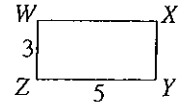
PQRS is a square. What is the length of *RS*?



Math

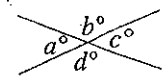
Perimeter of Rectangles

What is the perimeter of rectangle *WXYZ*?



Geometry

When lines intersect, **adjacent angles** are supplementary and add up to 180°. In the figure on the right, the angles marked *a* and *b* are adjacent and supplementary, so $a + b = 180$.

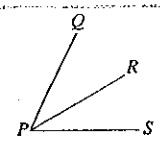


KAPLAN

180

Geometry

A **bisector** divides an angle into two half angles of equal measure. In the figure on the right, the big angle measures 60°, so the bisector divides it into two 30° angles.

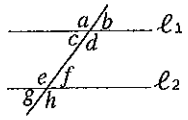


KAPLAN

30

Geometry

A **transversal** across parallel lines forms 4 equal acute angles and 4 equal obtuse angles (When the transversal is perpendicular to the lines it intersects, it forms eight 90° angles). In the figure on the right, *a* is an obtuse angle. The other three obtuse angles *d*, *e*, and *h* are equal to *a*.

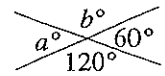


KAPLAN

d, *e*, and *h*

Geometry

When lines intersect, angles across the vertex from each other are called **vertical angles** and are equal. In the figure on the right, the angles marked *a*° and 60° are vertical, so $a = 60$.

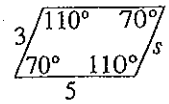


KAPLAN

60

Geometry

A **parallelogram** has two pairs of parallel sides. Opposite sides are equal. Opposite angles are equal. Consecutive angles add up to 180°. In the figure on the right, *s* is the length of the side opposite the 3, so $s = 3$.

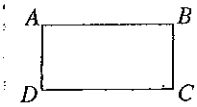


KAPLAN

3

Geometry

A **rectangle** is a 4-sided figure with 4 right angles. Opposite sides are equal. Diagonals are equal. *ABCD* is a rectangle, so angle *ABC* measures 90 degrees.

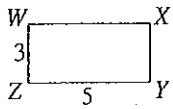


KAPLAN

90°

Geometry

The perimeter of a rectangle is equal to the sum of the lengths of the 4 sides. That is: Perimeter = 2(Length + Width). The perimeter of a 5-by-3 rectangle is $2(5 + 3) = 16$.

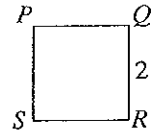


KAPLAN

16

Geometry

A **square** is a rectangle with 4 equal sides. *PQRS* is a square, so all sides are the same length as *QR*.



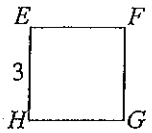
KAPLAN

2

Math

Perimeter of Squares

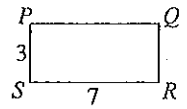
What is the perimeter of square *EFGH*?



Math

Area of Rectangles

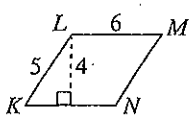
What is the area of rectangle *PQRS*?



Math

Area of Parallelograms

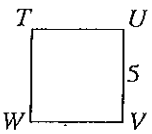
What is the area of parallelogram *KLMN*?



Math

Area of Squares

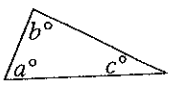
What is the area of square *TUVW*?



Math

Angles of Triangles

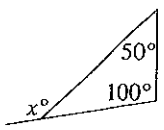
$a + b + c = ?$



Math

Exterior Angles of Triangles

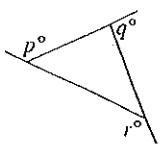
$x = ?$



Math

Sum of Exterior Angles

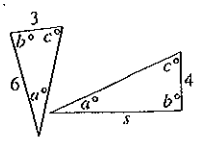
$p + q + r = ?$



Math

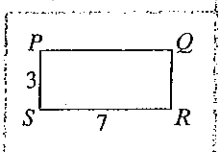
Similar Triangles

$s = ?$



Geometry

Area of a Rectangle = Length • Width. The area of a 7-by-3 rectangle is 7 • 3 = 21.

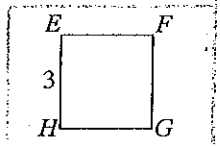


KAPLAN

21

Geometry

The perimeter of a square is equal to the sum of the lengths of the 4 sides. That is, since all 4 sides are the same length, Perimeter = 4(Side). If the length of one side of a square is 3, the perimeter is 4 • 3 = 12.

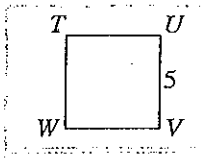


KAPLAN

12

Geometry

Area of a Square = (Side)^2. A square with sides of length 5 has an area of $5^2 = 25$.

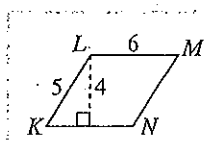


KAPLAN

25

Geometry

Area of a Parallelogram = Base • Height. The height is the perpendicular distance from the base to the top. In the parallelogram *KLMN*, 4 is the height when *LM* or *KN* is used as the base. Base • Height = 6 • 4 = 24.

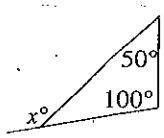


KAPLAN

24

Geometry

An exterior angle of a triangle is equal to the sum of the remote interior angles. The exterior angle labeled $x°$ is equal to the sum of the remote angles: $x = 50 + 100 = 150$.

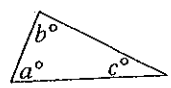


KAPLAN

150

Geometry

The 3 interior angles of any triangle add up to 180°.



KAPLAN

180

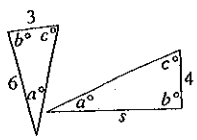
Geometry

Similar triangles have the same shape: corresponding angles are equal and corresponding sides are proportional. The triangles on the right are similar because they have the same angles. The 3 corresponds to the 4, and the 6 corresponds to the *s*.

$$\frac{3}{4} = \frac{6}{s}$$

$$3s = 24$$

$$s = 8$$

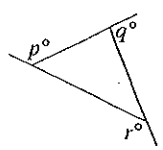


KAPLAN

8

Geometry

The 3 exterior angles of any triangle add up to 360°.



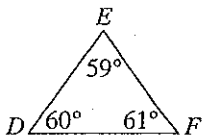
KAPLAN

360

Math

Sides and Angles of Triangles

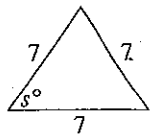
What is the longest side of triangle *DEF*?



Math

Equilateral Triangles

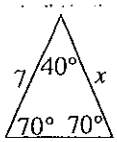
$s = ?$



Math

Isosceles Triangles

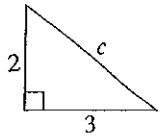
$x = ?$



Math

Pythagorean Theorem

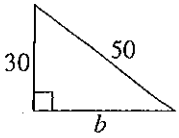
$c = ?$



Math

3:4:5 Triangles

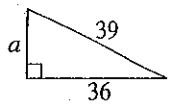
$b = ?$



Math

5:12:13 Triangles

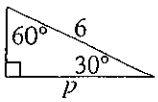
$a = ?$



Math

30–60–90 Triangles

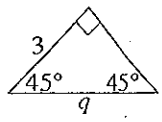
$p = ?$



Math

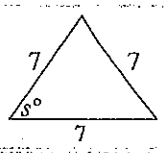
45–45–90 Triangles

$q = ?$



Geometry

An **equilateral triangle** has 3 equal sides and 3 60° angles.

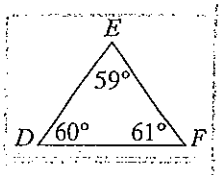


KAPLAN

60

Geometry

The longest side of a triangle is opposite the biggest angle, and the shortest side is opposite the smallest angle. Angle F is the biggest angle, so the side opposite—side $\overline{DE}$—is the longest.



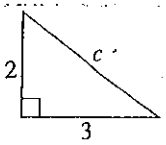
KAPLAN

$\overline{DE}$

Geometry

For all right triangles: $(\text{leg}_1)^2 + (\text{leg}_2)^2 = (\text{hypotenuse})^2$. If one leg is 2 and the other leg is 3, then:

$$2^2 + 3^2 = (\text{hypotenuse})^2$$
$$\text{hypotenuse} = \sqrt{4 + 9}$$
$$= \sqrt{13}$$

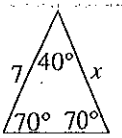


KAPLAN

$\sqrt{13}$

Geometry

An **isosceles triangle** has 2 equal sides, which are opposite 2 equal angles. The sides opposite the two 70° angles are equal, so $x = 7$.

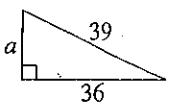


KAPLAN

7

Geometry

If a right triangle's leg-to-leg ratio is 5:12, or if the leg-to-hypotenuse ratio is 5:13 or 12:13, then it's a 5:12:13 triangle and you won't need to use the Pythagorean Theorem to find the third side. Just figure out what multiple of 5:12:13 it is. If one leg is 36 and the hypotenuse is 39, then this is 3 times 5:12:13. The other leg is 15.

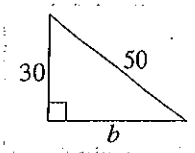


KAPLAN

15

Geometry

If a right triangle's leg-to-leg ratio is 3:4, or if the leg-to-hypotenuse ratio is 3:5 or 4:5, then it's a 3:4:5 triangle and you won't need to use the Pythagorean Theorem to find the third side. Just figure out what multiple of 3:4:5 it is. If one leg is 30 and the hypotenuse is 50, then this is 10 times 3:4:5. The other leg is 40.

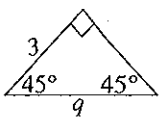


KAPLAN

40

Geometry

The sides of a **45–45–90 triangle** are in a ratio of $x{:}x{:}x\sqrt{2}$. You don't need to use the Pythagorean Theorem. If one leg is 3, then the other leg is also 3, and the hypotenuse is equal to a leg times $\sqrt{2}$, or $3\sqrt{2}$.

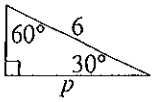


KAPLAN

$3\sqrt{2}$

Geometry

The sides of a **30–60–90 triangle** are in a ratio of $x{:}x\sqrt{3}{:}2x$. You don't need to use the Pythagorean Theorem. If the hypotenuse is 6, then the shorter leg is half that, or 3; and the longer leg is equal to the short leg times $\sqrt{3}$, or $3\sqrt{3}$.



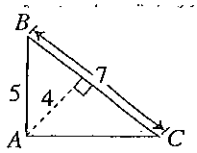
KAPLAN

$3\sqrt{3}$

Math

Area of Triangles

What is the area of triangle *ABC*?



Math

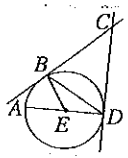
Triangle Inequality Theorem

If the length of one side of a triangle is 6 and the length of another side is 4, what is the complete range of possible values for the length of the third side?

Math

Circles

What line segment in the figure on the right is a chord but not a diameter of the circle with center *E*?



Math

Circumferences

What is the circumference of a circle with radius 3?

Math

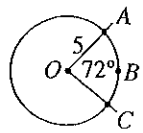
Area of Circles

What is the area of a circle with radius 3?

Math

Length of Arcs

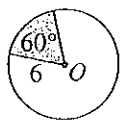
What is the length of arc *ABC*?



Math

Area of Sectors

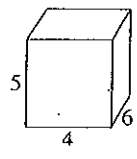
What is the area of the shaded region?



Math

Volume of Rectangular Solids

What is the volume of the rectangular box on the right?



Geometry

If you know the lengths of two sides of a triangle, then you also know something about the length of the third side: it's greater than the positive difference between, and less than the sum of, the other two sides. Given a side of 4 and a side of 6, the third side must be greater than $6 - 4 = 2$ and less than $6 + 4 = 10$.

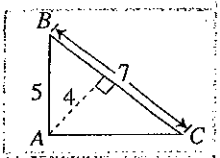
KAPLAN

2 < third side < 10

Geometry

Area of a Triangle = $\frac{1}{2}$(base)(height). The height is the perpendicular distance between the side that's chosen as the base and the opposite vertex. In this triangle, 4 is the height when the 7 is chosen as the base.

$$\text{Area} = \frac{1}{2}bh$$
$$= \frac{1}{2}(7)(4)$$
$$= 14$$



KAPLAN

14

Geometry

The **circumference** of a circle is the distance around it.

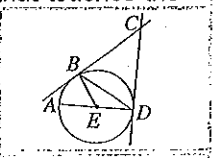
$$C = 2\pi r$$
$$= 2\pi(3)$$
$$= 6\pi$$

KAPLAN

6π

Geometry

The **diameter** of a circle is the distance across it through the center: $\overline{AD}$ is a diameter. The **radius** is the distance from the center to the edge: $\overline{AE}$, $\overline{BE}$, and $\overline{DE}$ are all radii. The radius is half the diameter. A **chord** is a line segment with endpoints on the circle: $\overline{BD}$ is a chord. A **tangent** is a line that touches the circle at one point. $\overleftrightarrow{BC}$ and $\overleftrightarrow{CD}$ are tangents.



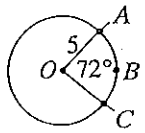
KAPLAN

$\overline{BD}$

Geometry

An **arc** is a piece of the circumference. The length of an arc $= \left(\frac{n}{360}\right)(2\pi r)$, where n is the measure of the arc's central angle. If the angle is 72°, then the arc length is $\frac{72}{360}$ or $\frac{1}{5}$ of the circumference:

$$\left(\frac{72}{360}\right)(2\pi)(5)$$
$$= \left(\frac{1}{5}\right)(10\pi)$$
$$= 2\pi$$



KAPLAN

2π

Geometry

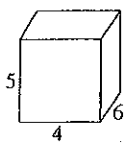
$$\text{Area} = \pi r^2$$
$$= \pi(3)^2$$
$$= 9\pi$$

KAPLAN

9π

Geometry

Volume of a Rectangular Solid = Length • Width • Height. The volume of a 4 by 5 by 6 box is $4 \bullet 5 \bullet 6 = 120$.



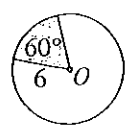
KAPLAN

120

Geometry

A **sector** is a piece of the area of a circle. The area of a sector $= \left(\frac{n}{360}\right)(\pi r^2)$, where n is the measure of the sector's central angle. If the angle is 60°, the sector is $\frac{60}{360}$ or $\frac{1}{6}$ of the area of the circle:

$$\left(\frac{60}{360}\right)(\pi)(6^2)$$
$$= \left(\frac{1}{6}\right)(36\pi)$$
$$= 6\pi$$



KAPLAN

6π

Math

Solving Quadratic Equations

If $x^2 + 12 = 7x$, what are the possible values of x?

Math

Solving Two Equations with Two Variables

If $4x + 3y = 8$ and $x + y = 3$, what is the value of x?

Math

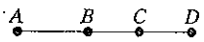
Inequalities

What is the complete range of values of x for which $-5x + 7 < -3$ and $-2x + 7 > 1$?

Math

Adding and Subtracting Line Segments

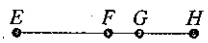
$AC = 9$, $BD = 11$, and $AD = 15$. What is the length of BC?



Math

Midpoints

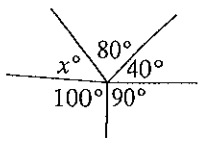
F is the midpoint of EH and G is the midpoint of FH. If $EH = 32$, what is the length of FH?



Math

Degrees Around Points

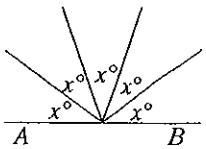
$x = ?$



Math

Degrees Around Straight Lines

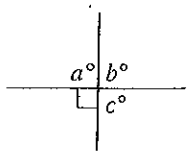
In this figure $\overleftrightarrow{AB}$ is a straight line. What is the value of x?



Math

Right Angles

$a + b + c = ?$



Algebra

You can solve for two variables only if you have two distinct equations. Combine the equations in such a way that one of the variables cancels out. To solve the two equations $4x + 3y = 8$ and $x + y = 3$, multiply both sides of the second equation by -3 to get $-3x - 3y = -9$. Now add the two equations: the $3y$ and the $-3y$ cancel out, leaving $x = -1$.

KAPLAN

–1

Algebra

To solve a quadratic equation, put it in the "= 0" form, factor the left side, and set each factor equal to 0 separately to get the two solutions. To solve $x^2 + 12 = 7x$, first re-write it as $x^2 - 7x + 12 = 0$. Then factor the left side:

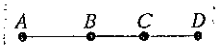
$$(x - 4)(x - 3) = 0$$
$$x - 4 = 0 \text{ or } x - 3 = 0$$
$$x = 4 \text{ or } 3$$

KAPLAN

4 or 3

Geometry

When points are on a line or line segment and the order is known, you can add or subtract lengths.
Since $AC = 9$ and $AD = 15$,
$CD = AD - AC = 15 - 9 = 6$.
Now, since $BD = 11$ and $CD = 6$,
$BC = BD - CD = 11 - 6 = 5$.



KAPLAN

5

Algebra

To solve an inequality, do whatever is necessary to both sides to isolate the variable. Just remember that when you multiply or divide both sides by a negative number, you must reverse the sign. To solve $-5x + 7 < -3$, subtract 7 from both sides to get $-5x < -10$. Now divide both sides by -5, remembering to reverse the sign: $x > 2$. To solve $-2x + 7 > 1$, subtract 7 from both sides to get $-2x > -6$. Now divide both sides by -2 (reversing the sign) to get $x < 3$.

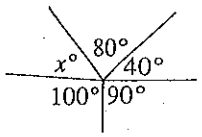
KAPLAN

$2 < x < 3$

Geometry

Angles that form a full sweep around a point add up to 360°. In the figure on the right,

$$x + 80 + 40 + 90 + 100 = 360$$
$$x + 310 = 360$$
$$x = 50$$

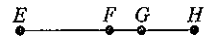


KAPLAN

50

Geometry

The **midpoint** of a segment divides it into two halves of equal length. Since $EH = 32$ and F is the midpoint of $\overline{EH}$, $FH = \frac{32}{2} = 16$. Then, since G is the midpoint of $\overline{FH}$, $FG = \frac{16}{2} = 8$.



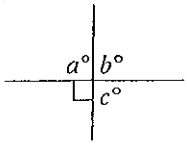
KAPLAN

8

Geometry

A **right angle** measures 90° and is usually indicated in a diagram by a little box, as in the figure on the right. The two lines in this figure are **perpendicular**; all four angles measure 90°, so:

$$a + b + c$$
$$= 90 + 90 + 90$$
$$= 270$$



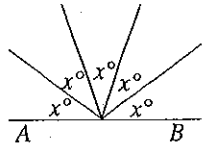
KAPLAN

270

Geometry

Angles that form a straight line add up to 180°. In the figure on the right, five angles, all marked $x°$, add up to a straight line.

$$x = \frac{180}{5} = 36$$



KAPLAN

36

Math

Union and Intersection of Sets

If Set $A = \{1, 2\}$ and Set $B = \{3, 4\}$, then what is the union of A and B?

Math

Absolute Value

$|-7| = ?$

Math

Radical Equations

If $5\sqrt{x} - 2 = 13$, then $x = ?$

Math

Negative Exponents

$3^{-2} = ?$

Math

Functions

If $f(x) = 2x + 3$, then $f(4) = ?$

Math

Direct Variation

Currency A is worth 2 units of Currency B. If the number of units of B were to double, the number of units of A would...?

Math

Domain and Range

What is the range of $f(x) = x^2$?

Math

Finding Midpoints

What is the midpoint of (3,5) and (9,1)?

Algebra

The **absolute value** of a number is the distance of the number from zero on the number line. Because absolute value is a distance, it is always positive. The absolute value of 7 is 7; this is expressed $|7|=7$. Similarly, the absolute value of –7 is 7: $|-7| = 7$. Every positive number is the absolute value of two numbers: itself and its negative.

KAPLAN

7

Arithmetic

The things in a set are called elements or members. The **union** of Set A and Set B, sometimes expressed as $A \cup B$, is the set of elements that are in either or both of Set A and Set B. If Set $A = \{1, 2\}$ and Set $B = \{3, 4\}$, then $A \cup B = \{1, 2, 3, 4\}$. The **intersection** of Set A and Set B, sometimes expressed as $A \cap B$, is the set of elements common to both Set A and Set B. If Set $A = \{1, 2, 3\}$ and Set $B = \{3, 4, 5\}$, then $A \cap B = \{3\}$.

KAPLAN

{1, 2, 3, 4}

Algebra

The rule for a number raised to a negative power is $a^{-b} = \frac{1}{a^b}$.

$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$

KAPLAN

$\frac{1}{9}$

Algebra

A **radical equation** contains at least one radical expression. Solve radical equations by using standard rules of algebra. If $5\sqrt{x} - 2 = 13$, then $5\sqrt{x} = 15$ and $\sqrt{x} = 3$, so $x = 9$.

KAPLAN

9

Algebra

In **direct variation**, $y = kx$, where k is a nonzero constant. So y changes directly as x does. If a unit of Currency A is worth 2 units of Currency B, then $A = 2B$. If the number of units of B were to double, the number of units of A would double, and so on for halving, tripling, etc.

KAPLAN

double

Algebra

Standard function notation is written $f(x)$ and read "f of x." To evaluate the function $f(x) = 2x + 3$ for $f(4)$, replace x with 4 and simplify.

$f(4) = 2(4) + 3 = 11$

KAPLAN

11

Geometry

The **midpoint** of two points is the average of the x-coordinates and the average of the y-coordinates. If the points are (x_1,y_1) and (x_2,y_2), the midpoint is $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$. The midpoint of (3,5) and (9,1) is $\left(\frac{3 + 9}{2}, \frac{5 + 1}{2}\right) = (6,3)$.

KAPLAN

(6,3)

Algebra

The **domain** of a function is the set of values for which the function is defined. For example, the domain of $f(x) = \frac{1}{1 - x^2}$ is all values of x except 1 and –1, because for those values the denominator has a value of zero and is therefore undefined. The **range** of a function is the set of outputs or results of the function. For example, the range of $f(x) = x^2$ is all numbers greater than all or equal to zero, because x^2 cannot be negative.

KAPLAN

all numbers greater than or equal to zero

Geometry

The formula to find the distance between two points (x_1,y_1) and (x_2,y_2) is **distance** $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

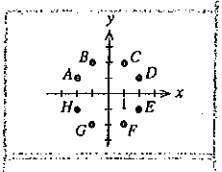
$\sqrt{(7-1)^2 + (9-1)^2}$
$= \sqrt{6^2 + 8^2}$
$= \sqrt{36 + 64}$
$= \sqrt{100}$
$= 10$

KAPLAN

10

Geometry

The first number in an ordered pair is the *x*-coordinate and tells how far to go to the right or left. The second number is the *y*-coordinate and tells how far to go up or down. To plot (–1,2), go left 1 and up 2.

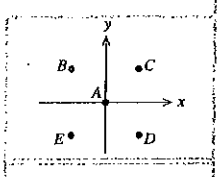


KAPLAN

B

Geometry

Remember that the *x*-coordinate is negative in the two quadrants on the left, and the *y*-coordinate is negative in the two quadrants on the bottom. *C* and *E* are the points for which the product *xy* is positive. The coordinates of *C* are both positive, so the sum is positive. The coordinates of *E* are both negative, so the sum is negative.



KAPLAN

E

Geometry

Slope $= \frac{\textbf{change in } y}{\textbf{change in } x} = \frac{\textbf{rise}}{\textbf{run}}$. The slope of the line that contains the points $A(2,3)$and $B(0,-1)$ is

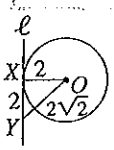
$\frac{y_B - y_A}{x_B - x_A}$
$= \frac{-1-3}{0-2}$
$= \frac{-4}{-2}$
$= 2$

KAPLAN

2

Geometry

When a line is **tangent** to a circle, the radius of the circle is perpendicular to the line at the point of contact. So $\angle OXY = 90°$, making ΔOXY a 45–45–90 triangle. In a 45–45–90 triangle, the ratio of leg to leg to hypotenuse is $x{:}x{:}x\sqrt{2}$. Given leg measures of 2, hypotenuse $\overline{OY}$ must measure $2\sqrt{2}$.



KAPLAN

$2\sqrt{2}$

Arithmetic

A **geometric** (or exponential) **sequence** is one in which the ratio of consecutive terms is constant. If *r* is the ratio between consecutive terms, a_1 is the first term, and a_n is the *n*th term, then $a_n = a_1 r^{n-1}$. In this case, a_n is the fifth term, the term you're looking for, $a_1 = 8$,and *r* is $\frac{3}{2}$, since each term is 1.5 times the previous term. So:

$a_5 = (8)\left(\frac{3}{2}\right)^4 = (8)\left(\frac{81}{16}\right) = \frac{81}{2} = 40.5.$

KAPLAN

40.5

Algebra

The rule for a number raised to a fractional power is $x^{\frac{y}{z}} = \sqrt[z]{x^y}$.

$4^{\frac{3}{2}} = \sqrt[2]{4^3}$
$= \sqrt[2]{64}$
$= 8$

KAPLAN

8

Algebra

In **inverse variation**, $xy = k$, where *x* and *y* are variables and *k* is a constant. Here, homework time is *x*, and TV time is *y*. Use the given values to find *k*, then calculate homework time when TV time is 2 hours.

$(1)(1) = 1 = k$
$(x)(2) = 1$
$x = \frac{1}{2}$

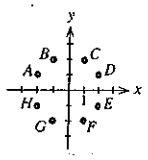
KAPLAN

$\frac{1}{2}$ hour

Math

Plotting Points on the Coordinate Plane

Which point represents (–1,2)?



Math

Distance between Points

What is the distance between $P(1,1)$ and $Q(7,9)$?

Math

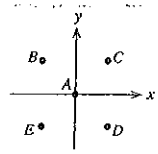
Slopes

What is the slope of the line that contains the points $A(2,3)$ and $B(0,-1)$?

Math

Quadrants

For which point (x,y) in the coordinate plane shown must it be true that xy is positive and $x + y$ is negative?



Math

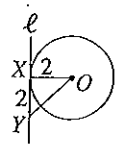
Geometric Sequences

What is the fifth term in the geometric sequence 8, 12, 18, 27, ...?

Math

Tangency

If line ℓ is tangent at point X to the circle centered at O, what is the length of $\overline{OY}$?



Math

Inverse Variation

The time Leo spends doing homework varies inversely with the time he spends watching TV. If he spent one hour watching TV and one hour doing homework last night, how long will he spend on tonight's homework if he watches 2 hours of TV?

Math

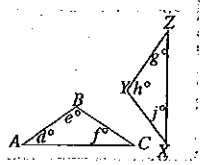
Fractional Exponents

$$4^{\frac{3}{2}} = ?$$

Math

Congruence

ABC is congruent to *XYZ*. Which of the angles is equal to *f*?



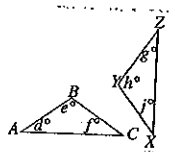
Math

Parallel and Perpendicular Lines

What is the slope of a line perpendicular to the line $y = 5x + 8$?

Geometry

When two figures are congruent, they are identical. You can imagine rotating *ABC* to get *XYZ*—angle *f* would rotate up to the top, where angle *g* is.



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Geometry

If a line is **perpendicular** to another line, then the angle formed by their intersection is 90 degrees. The slope of a line perpendicular to another line is the negative reciprocal of the slope of the other line. In this case, the slope of the given line is 5, so the slope of a line perpendicular to it is $-\frac{1}{5}$. The slope of a line parallel to another line is the same as the slope of the other line.

KAPLAN

$-\frac{1}{5}$

Bell Ringer Activities

Each day place a bell ringer activity on the board. A bell ringer is a short activity that can be completed while you take attendance, collect homework, or other small chores. The activities should be read and comments made but do not necessarily get a grade. These activities should help you gain an understanding of your students' classroom knowledge as well as personal feelings, attitudes, and beliefs.

1. Place a single review question related to yesterday's instruction on the board. Ask students to write a response to the question. ***(This bell ringer will give you a quick glance regarding student understanding.)***

2. Ask a safety question. Ask students to explain what will happen with a safe practice and what could happen if proper safety is not followed.

3. Ask students: "Describe your favorite teacher, other than me."

4. Collect a few newspapers (Winchester Sun, Lexington Herald-Leader, USA Today, Smoke Signals). Ask students to look through a page or two of the paper, pick out an item in the paper, and write a paragraph or brief page on what they found. ***(Students can use any item in the paper—an article, advertisement, movie listing, obituaries, cartoons, etc. Let their imagination take them where they want to go. After your chores, ask one or two students to share what they found.)***

5. Turn the television onto CNN or some other news channel. Ask the students to write an opinion or comment on what they hear.

6. Purchase a few trade magazines. Have students find an article to review. Ask students to read the article. ***(Students may only have time to select an article and read only a portion of it. You can use this over multiple days.)***

7. Find an interesting article in a magazine or paper. Duplicate the article for each student. Ask students to read the article. Write one or two questions on the board for students to answer regarding the article.

8. Ask students: "Where do you want to be in five years? Explain"

9. Ask students: "What do you believe are your strengths and weaknesses? Make two columns and list strengths and weaknesses." ***(Any type of question that may be asked during an employment interview is good practice for the students.)***

10. Ask students: "What do you plan to do after graduation—college or work? Explain specifically where you plan to be and why? If you haven't planned, list five college majors or employers you may be interested in knowing more about.

11. Ask students: "You are the principal of the school. What rule would you implement or delete? Why?"

12. Bring in an odd or antique tool of the trade or a piece of unusual looking equipment. Have students write down what they think it is and how it works.

13. Ask students: "You see a student stealing a tool from the shop. What do you do?"

14. Give each student a city map of Winchester. You can get these free from the Chamber of Commerce or City Hall. Ask students to make with a highlighter where they live, the Area Technology Center/high school, and their four favorite places—friends home, Walmart, movie theater, Dairy Queen, etc.

15. Ask students: "Tell me who you most admire. Why?"

16. Ask students: "Tell me your favorite meal include drink and dessert."

17. During the peak ball season, ask students: Do you plan on attending the game. Why or why not?"

18. Ask students: "Where would be your ideal vacation spot?"

19. Ask a math question or problem related to your previous lesson.

20. Ask students: "Describe your best friend." ***(This question many times will give you insight into your student because he/she will tend to describe qualities that they also possess.)***

21. Ask students: "Write a brief description of where you see yourself in ten years."

22. Ask students: "What has been your favorite activity in the class so far?" Ask this about ¼ of the way through the year to get a gauge of student likes and dislikes.

23. Ask students: "Tell me about a conflict you have had with another person. How did you resolve it?"

24. Ask students: "Identify a list of adults you feel are your greatest supporters. Tell why."

25. Ask students: "Identify your favorite song and band/singer. Why do you enjoy their/his/her music?"

End of Class Activities

1. Ask students to write a letter to a student who is absent. Let them tell the activities of the day and what was learned. ***(This will help you check for understanding as well as give the absent student guidance on what was missed.)***

2. Pair up students. Have each student tell his/her partner what they learned or what they enjoyed most about the class that day. Ask each pair to write one sentence describing their discussion.

Activities For "I Need a Break" Sessions

1. Begin a story with one sentence on the board. Place students in teams. One student begins by adding one sentence to the story and passes the paper to the next student in the team. That student will add one sentence to the story and pass to the next student in the team. Continue the pattern. At the end choose one student to read the team's story.

2. Pick an activity from the "Why Try" series.

3. Develop a library of DVD's—fun movies that portray someone in the trade or focus on the industry. PG only.

4. Play a review game with the students. Take questions from the next test and develop a game.

5. Art Project—ask student to draw something related to the trade.