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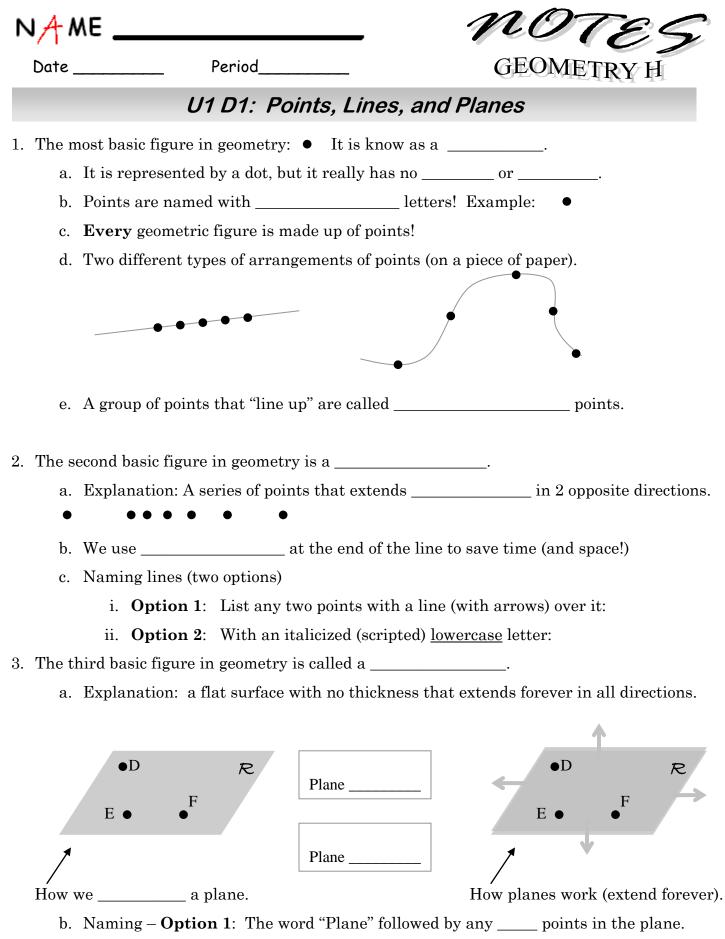
Date _____ Period_____

SYLLABUS

GEOMETRY H

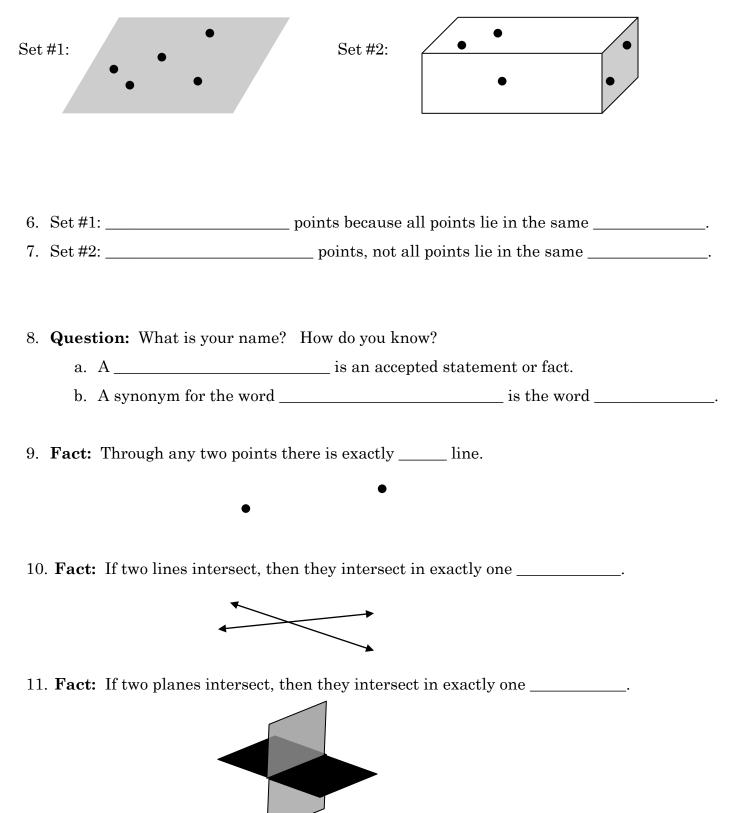
Unit 1: Tools of Geometry / Reasoning and Proof

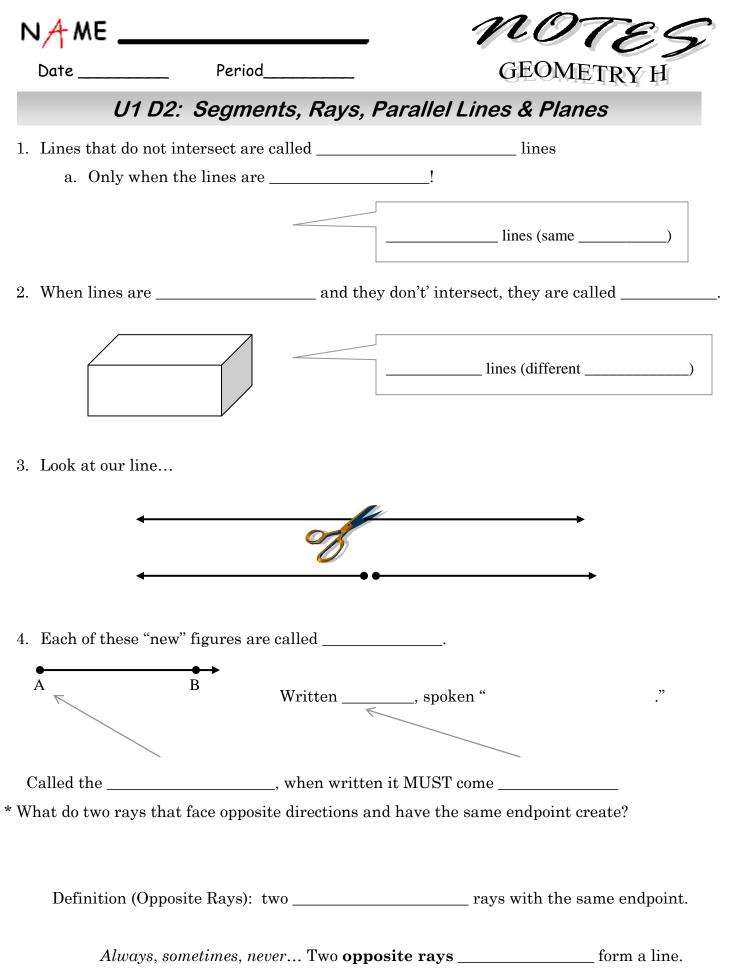
Day	<u>Topic</u>
1	Points, Lines and Planes
2	Segments, Rays, Parallel Lines and Planes
3	Measuring Segments
4	Measuring Angles Basic Constructions
5	The Coordinate Plane Perimeter, Circumference and Area
6	Quiz
7	Conditional Statements Biconditionals and Definitions
8	Deductive Reasoning Reasoning in Algebra
9	Proving Angles Congruent
10	Review
11	Test



Option 2: The word "Plane" followed by a ______ italic letter.

- 4. The 3 basic shapes of geometry (______, _____, and _____) are the "undefined terms of geometry" because they are so basic, we can't define them.
- 5. At your seat: Describe the two different sets of points, name them if possible.

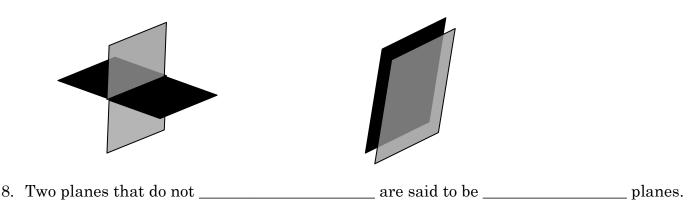




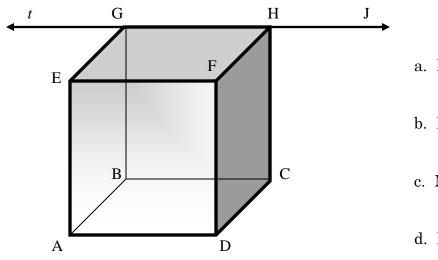
5. What do we get if we "cut" the line twice? This is called a _____.

Called ______. Now order does ______ matter. Why?

- 6. Quick Vocabulary Review. Fill in the Missing Information.
 - b. Line: Extends forever in _____ direction(s).
 - c. **Ray**: Extends forever in ______ direction(s).
 - d. Segment: Extends forever in _____ direction(s).
- 7. What's the difference between the two pairs of planes shown below?



9. Look at the figure below and describe the connection between line t and plane ABC.



More Questions

- a. Name a pair of parallel planes.
- b. Name a pair of skew lines.
- c. Name a pair of parallel lines.
- d. Name a ray.

."

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U1 D3: Measuring Segments

1. What's the distance between your house and the your school?

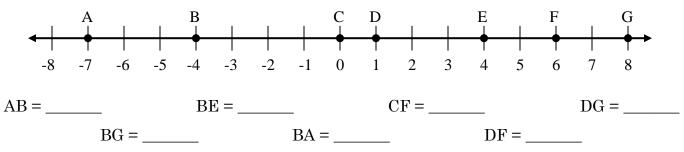


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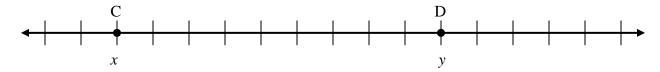
- 2. Is your house and your school in a "straight line?"
 - e. Answer: ______ establish a (straight) line.
 - f. The _____ Postulate:
 - i. Any two points can be put onto a number line and measured.



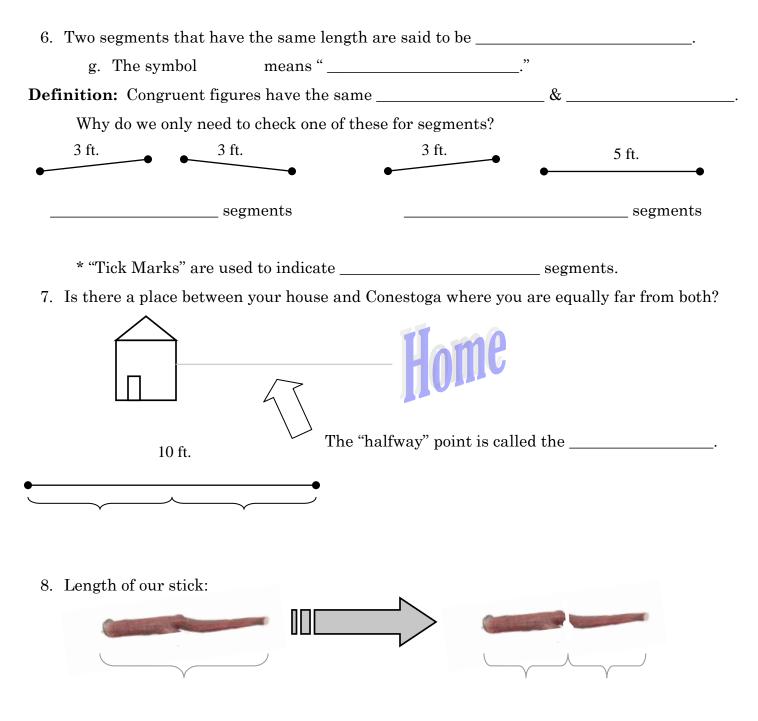
4. Find the length of each segment listed below:



5. How do you find the distance between two points on a number when the units are variables?

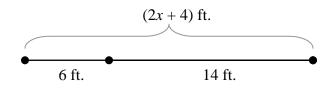


*** Distance formula on a number line:



Note: The stick can be broken any way you want, but the two pieces must add up to _____. Does this seem obvious? What do we call something that we accept as obvious? This illustrates the ______

Solve for x.



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CLASSWORK GEOMETRY H

U1 D4: Angles Vocabulary

Fill in the boxes below... use all resources available (friends, books, etc.)

Angle Type	Draw an Example	Describe or Define
Acute Angle		
Obtuse Angle		
Right Angle		
Straight Angle		
Congruent Angles		

	r
Complimentary Angles	
Supplementary Angles	
Angle Addition Postulate	
Vertical Angles	
Adjacent Angles	
Angle Bisector	

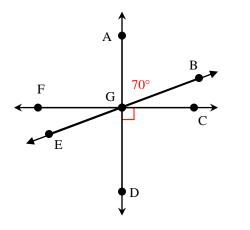
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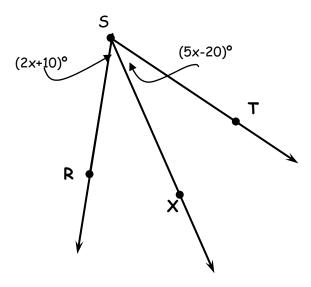
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U1 D4 Continued: Problem Set for Vocabulary

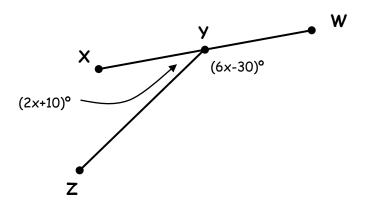
Directions: Use the figure below to answer questions 1-5.



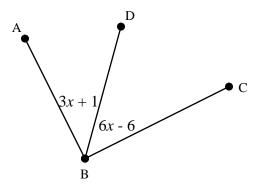
- 1. Name an angle complimentary to $\angle AGB$.
- 2. Name an angle supplementary to $\angle AGB$.
- 3. What type of angle is $\angle AGD$?
- 4. What angle is vertical to $\angle BGC$? What is its measure?
- 5. Name an angle that is congruent to $\angle AGB$.
- 6. In the figure below \overrightarrow{SX} bisects $\angle RST$. Find the measure of $\angle RST$.



7. Use the figure below to find $m \angle WYZ$.



8. In the figure below, $m \angle ABC = 43 + x$. Find *x*.

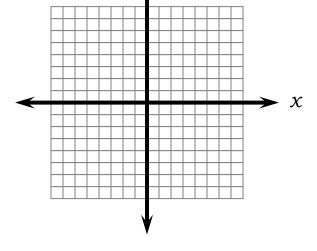


9. What postulate did you need to use to solve the problem in #8?

10. $\angle 1$ is twice the size of its compliment. What are the degree measures of both angles?

NAME_		NOTES
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	U1 D5 Part 1: The C	Coordinate Plane

- 1. The coordinates of point A is (6, 6) and point B is (3, 2). Plot the points below.
- 2. What is the length of segment AB (round to nearest tenth if necessary)?
- 3. What is the midpoint of segment AB?



Midpoint Formula



<u>Honors Level Question</u>: The endpoint of a segment is (2, 3) and the midpoint is (3, -4). What is the other endpoint?

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U1 D5 Part 2 Perimeter, Circumference and Area



<u>Area</u>

Perimeter



<u>Area</u>

Circumference

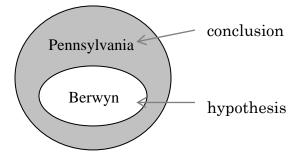
- 1. What is the perimeter and area of a rectangle with a height of 6 and base of 14?
- 2. What is the area of a circle with a circumference of 14π ?
- 3. What is the perimeter of the figure created on the coordinate plane with the points... A(-4, -1), B(4, 5), C(4, -2)

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U1 D7: Conditional Statements, Biconditionals & Definitions

Conditionals can be represented visually using a _____ diagram.

Conditional: If you live in Berwyn, then you live in Pennsylvania.



Example #1: If an animal is a reptile, then it is cold-blooded.

Conditional: If an angle's measure is 90 degrees, then the angle is right.

Converse: If an angle is right, then its measure is 90 degrees.

When both the conditional and the converse are true, you can combine them into one statement.



known as a ______.

Make up a Biconditional...

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U1 D8: Deductive Reasoning & Reasoning in Algebra

Directions: Make a valid conclusion from each set of statements below.

1. If a student wants to go to college, then a student must study hard. Rashid wants to go to the University of North Carolina.

Conclusion:

Conclusion:

2. If an animal is a red wolf, then its scientific name is *Canis rufus*. If an animal is named *Canis rufus*, then it is endangered.

3. If you read a good book, then you enjoy yourself. If you enjoy yourself, then your time is well spent.

Conclusion:

4. If there is lightning, then it is not safe to be out in the open. Maria sees lightning from the soccer field.

Conclusion:

The Law of Detachment:

The Law of Syllogism:

These laws are forms of ______ reasoning, which is strong reasoning based on facts.

Inductive reasoning is more of a "guess," and is based on continuing a _____

- 1. We can use deductive reasoning to perform proofs.
 - a. Remember, a theorem **must be proven**!
- 2. Example: An Algebraic Proof. Solve $\frac{1}{2}x + 6 = 10$

Statements (Steps to Solve)	Reasons (What you did)
1. $\frac{1}{2}x + 6 = 10$	1.
2. $\frac{1}{2}x = 4$	2.
3. $x = 8$	3.

- 3. Properties you are probably familiar with...
 - a. Addition Property of Equality
 - b. Subtraction Property of Equality
 - c. Multiplication Property of Equality
 - d. Division Property of Equality
 - e. The Distributive Property
 - f. Simplifying
- 4. For the two examples below, describe the difference in the operations. Which reason would you use for each?

a) If $8+2x+3=23$, then $2x+11=23$	b) If $3x-5=13$, then $3x=18$

- 5. Properties you probably are not familiar with
 - a. The Reflexive Property
 - b. The Symmetric Property
 - c. The Transitive Property

d. Substitution Property

a) The **Refl**exive Property: Think of when you look in a mirror and you see your **refle**ction.



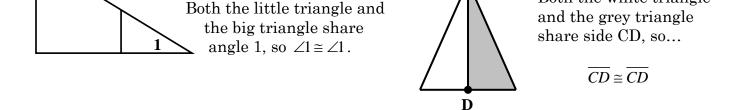
Any time you have a number (angle, side length, etc.), you can always write that it is equal (or congruent) to **itself**.

Examples: 10 = 10, x = x, $\overline{AB} \cong \overline{AB}$, $m \angle ABC = m \angle ABC$

С

Both the white triangle

When will this be used? Whenever two figures share something.



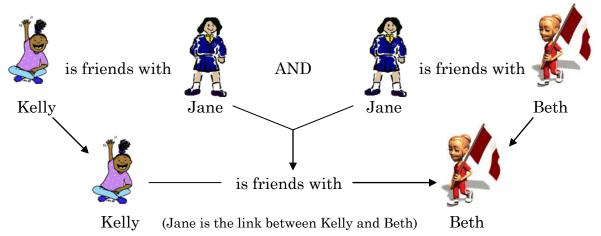
b) The Symmetric Property: Think of when you solve equations and the *x* is on the right.

You might like to always have your *x* on the left hand side, and you probably learned that you are allowed to switch sides – this is the symmetric property.

```
When solving an equation, if you end with this: 6 = x
You can switch it to this: x = 6
```

Other examples: $\overline{CD} \cong \overline{FG}$ switches to $\overline{FG} \cong \overline{CD}$ $\angle 1 \cong \angle 2$ switches to $\angle 2 \cong \angle 1$

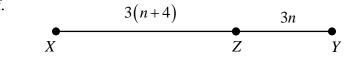
c) The Transitive Property (Substitution): Think of your two closest friends...



Example #1:	Fill in each reason on the right that matches with the statement on the left

1. $5(x+3) = 5-9$	1.
2. $5x+15=5-9$	2.
3. $5x + 15 = -4$	3.
4. $5x = -19$	4.
5. $x = \frac{-19}{5}$	5.

Example #2: Geometric Proof.



Given: XY = 42

1. $XZ + ZY = XY$	1.
2. $3(n+4)+3n=42$	2.
3. $3n+12+3n=42$	3.
4. $6n+12=42$	4.
5. $6n = 30$	5.
6. $n = 5$	6.

Other Reasons you might use...

- a. Definition of a midpoint
- b. Definition of an angle bisector
- c. Vertical angles property

Reasons are comprised of properties, postulates, theorems, definitions, and sometimes a few other things

Wrap Up: Partner Quizzo

Partner A: use your notes and quiz your partner B about reasons we learned today.

Once you have successfully described 3 reasons, switch places...

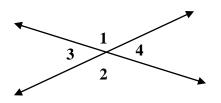


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Period

U1 D9: Proving Angles Congruent

- 1. Vocabulary Review:
 - h. An accepted fact is known as a _____.
 - i. An educated guess is known as a _____.
 - j. A proven fact is known as a _____.
- 2. Let's prove a theorem:
 - k. The Vertical Angles Theorem: Vertical angles are congruent.



i. Given: Intersecting lines that form angles 1-4.

Sometimes this is stated for you, sometimes you must "get it" from a picture.

Usually it is just what the theorem says ii. Prove: $\angle 1 \cong \angle 2$ Sometimes interpreted to **your** picture.

3.

Statements	Reasons (Postulates, Theorems, Definitions)
1.	1. Zw
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

Date

The type of proofs we've done so far are called _____ proofs. You can also do ______ proofs by writing your steps out as sentences (this is usually more difficult – especially for beginners).

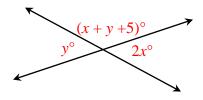
4. **Congruent Supplements Theorem:** If two angles are supplements of the same angle (or of congruent angles), then the two angles are congruent

Given: $\angle 1$ and $\angle 2$ are supplementary & $\angle 3$ and $\angle 2$ are supplementary Prove: $\angle 1 \cong \angle 3$

	2 3
Statements	Reasons (Postulates, Theorems, Definitions)
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

(The proof above can also be done as a paragraph proof)

#31 from tonight's Homework:



NA ME		HOMEWORK
Date	Period	GEOMETRY H

U1 D10 – Test Review: Sections 1.3-1.9, 2.1-2.5

12. Fill in the blanks below with *always*, *sometimes*, or *never*.

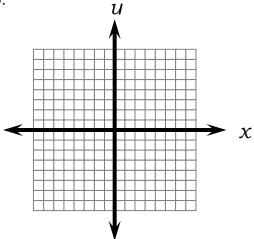
- a. \overrightarrow{AC} is in Plane Q, so point B is _____ in Plane Q.
- b. Two planes that do not intersect are _____ parallel.
- c. \overrightarrow{JK} are \overrightarrow{JM} ______ the same ray.
- d. Three points are _____ coplanar.
- e. Intersecting lines are _____ parallel.
- 13. $\angle A$ and $\angle B$ are complimentary. $\angle A$ is twice as big as $\angle B$, what are the measure of the two angles?

14. \overrightarrow{BD} bisects $\angle ABC$; $\angle ABD = 6x + 2$ and $\angle DBC = 3x + 26$. Draw the figure and find $m \angle ABC$.

15. Point X is the midpoint of W and Y. XW = 3x + 8 and XY = 9x - 10. What is the length of WY?

16. The area of a circle is 36π , what is the circumference of that circle?

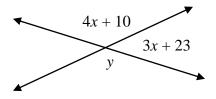
17. A rectangle has coordinates A(5, 3), B(5, -2), C(1, -2), D(1, 3). What is the area of rectangle ABCD?



18. M is the midpoint of segment AB. A(5, 9) and M(11, 19). What are the coordinates of B?

19. Line AB is in Plane Q. Line t intersects plane Q at point A. Draw and label the figure.

20. Solve for x and y in the figure below.



21. Draw skew lines.

22. In the conditional below, underline the hypothesis, and circle the conclusion. If two segments have equal measures, then they are congruent.

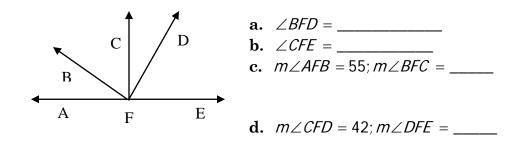
23. Write the converse of the condition from #11.

24. Define/Describe a biconditional. Give a mathematical example

25. Write a valid conclusion or write "no valid conclusion for the statements below."

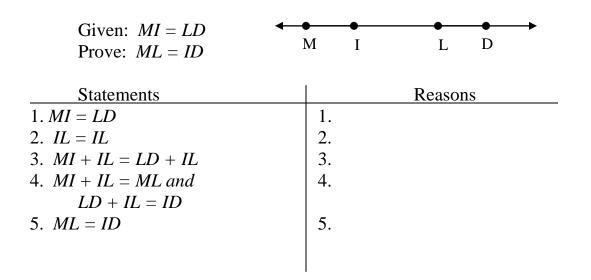
- a. **Conditional:** If M is the midpoint of AB, then AM = BM.
 - i. Given: M is the midpoint of AB
 - ii. Conclusion:
- b. Conditional: Given 3 random points, they are always coplanar.
 - i. Given: Points X, Y, Z
 - ii. Conclusion:

26. Find the measures of the indicated angles below.

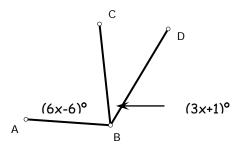


Note: $\overrightarrow{AE} \perp \overrightarrow{FC}$, $\overrightarrow{BF} \perp \overrightarrow{FD}$

27. Complete the proof below...



28. Solve for x, then find $m\angle$ CBD given that $m\angle$ ABD = (43+x)°.



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GEOMETRY H

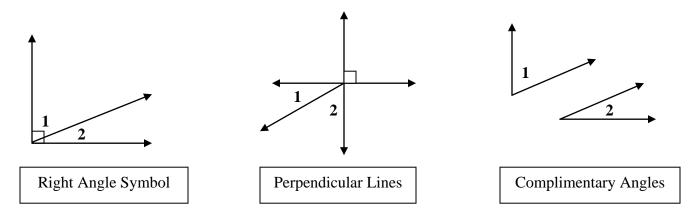
Solving Problems Involving Angles

There will be three main options for problems with angles: $\angle 1 = \angle 2$, $\angle 1 + \angle 2 = 90^{\circ}$, $\angle 1 + \angle 2 = 180^{\circ}$.

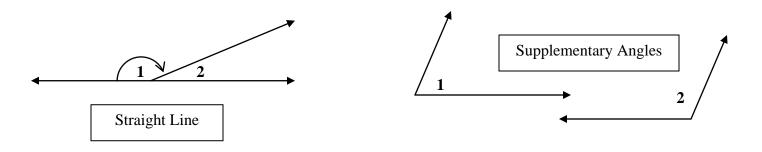
1. Set the two expressions equal to each other: (Angle 1) = (Angle 2)



2. Add the two angles up and set them equal to 90: (Angle 1) + (Angle 2) = 90.

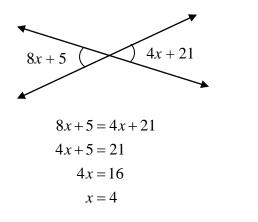


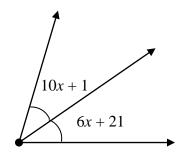
3. Add the two angles up and set them equal to 180: (Angle 1) + (Angle 2) = 180.

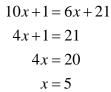


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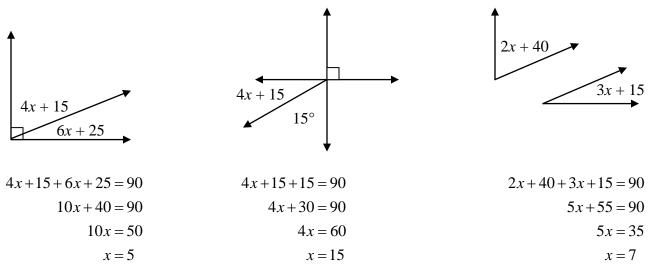
1. Angles are equal to each other.



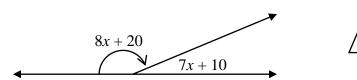




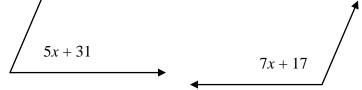
2. Angles add up to 90°.



3. Angles add up to 180°.



8x + 20 + 7x + 10 = 18015x + 30 = 18015x = 150x = 10



5x+31+7x+17 = 18012x+48 = 18012x = 132x = 11