Foundations of Common Core Math 3

Unit 2B – Writing Equations of Lines and Two Column Proofs

Name: ____

WAKE COUNTY
PUBLIC SCHOOL SYSTEM

APEX HIGH SCHOOL
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APEX, NC 27502

FCC3: Unit 2B

Writing Equations of Lines and Writing Two Column Proofs

Day	Lesson / CW	Homework	WarmUP / Exit
Day 1: Wed 9/24	Match Activity (p.3) Writing Equations of Lines (p.4 odds)	p.4 evens	7,8,9,10
Day 2: Fri 9/26	Parallel lines WS1 (p.5 odds) WS2 (p.6-7 odds)	p. 5-7 evens	1-5, 12-14
Day 3: Mon 9/29	Proof intro (p.8) Two column proof examples (p9-10) Scramble 5-2 (p11), WS3 1&2 (p13)WS4 1&2(p15)	Scramble 5-1(p12) WS3 3&5(p14) WS4 3&4(p16)	6,11
Day 4: Tues 9/30	WS5 1-12 all (p17-18) in groups	WS6 all (p19-20) STUDY for test	
Day 5: Wed 10/1	Unit 2B TEST (counts as a half tst)		

SYMBOLS

Match the symbol in the 1st column with the correct definition in the 3rd column.

Symbol	Matching Definition	Definitions
$=$		**A)** Absolute Value – it is always equal to the positive value of the number inside the lines. It represents the distance from zero.
$m\angle C$		**B)** Congruent – figures with the same size and shape.
GH		**C)** Parallel – used between segments, lines, or rays to indicate that they are always the same distance apart.
ΔABC		**D)** Line segment with endpoints G and H - line segments can be congruent to each other (you would never say they are equal).
$\perp$		**E)** Ray GH - the letter on the left indicates the endpoint of the ray.
$\angle ABC$		**F)** Equal – having the same value as another.
$\overleftrightarrow{GH}$		**G)** Plus or minus – indicates 2 values, the positive value and the negative value.
$\cong$		**H)** Triangle ABC.
~		**J)** The measure of angle C – it would equal a number.
$\overline{GH}$		**K)** Perpendicular – used between segments, line, or rays to indicate that they are at right angles (90°).
$\overrightarrow{GH}$		**L)** Angle ABC – the middle letter is always the vertex of the angle
//		**M)** Similar – figures with the same shape but not necessarily the same size.
±		**N)** The length of segment GH – it would equal a number.
$\lvert x \rvert$		**O)** The infinite line GH – lines are not equal or congruent to other lines.

Algebraic PROPERTIES used in geometry

Property	Example(s)	
Distributive	3(n + 5) = 3n + 15	
	-(x – 8) = -x + 8	
Substitution	if 5x + 12 - 2x = 18, then 3x + 12 = 18	(combining like terms, simplifying)
	If 7x + y = 9 and y = -3, then 7x – 3 = 9	(replacing y with -3)
Reflexive	-3 + x = -3 + x	ONE EQUATION
	AB = AB	
Symmetric	if y = 7 then 7 = y	TWO EQUATIONS
	If $\overline{AB} \cong \overline{CD}$ then $\overline{CD} \cong \overline{AB}$	
Transitive	if a = b and b = c then a = c	THREE EQUATIONS
	If $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CD}$ then $\overline{AB} \cong \overline{CD}$	

Properties of Equality:

Addition prop. of =	IF 3x – 8 = 10, then 3x = 18	*add an equal amount to both sides
	If AB = DE then AB + BC = DE + BC	
Multiplication prop. of =	if $\frac{x}{3} = -4, \textit{then} \ \ x = -12$	*multiply both sides by an equal amount
Subtraction prop. of =	if x + 5 = -6, then x = -11	*subtract both sides by an equal amount
	If AB + BC = CD + BC, then AB = CD	
Division prop. of =	if 3x = 12, then x = 4	*divide both sides by an equal amount
	If 3AB = 6EF, then AB = 2EF	

Students will be able to . . .

- Write the equations of lines given two pieces of information in specific forms

- Define parallel and perpendicular lines by their characteristics

- Use a two column proof to prove theorems about lines, angles and triangles.

- Determine values in algebraic expressions by recognizing angle relationships

- Understand all the angles created when a transversal intersects two parallel lines

Unit Vocabulary

Linear equations: equations that graph to be a straight line

Point Slope Form: $y - y_1 = m(x - x_1)$ Helpful for writing equations of lines knowing that (x_1, x_2) is any point on the line and m = slope

Parallel lines: two lines having the same slope

Perpendicular lines: two lines having opposite reciprocal slopes.

x-intercept: the pint where the line crosses the X-axis. Written as an ordered pair (x,0)

y-intercept: the point where the line crosses the Y-axis. Written as the ordered pair (0,b)

Slope from the standard form of an equation is $\frac{-A}{B}$.

Geometry Review

Complementary angles: two angles whose measures add to 90˚

Supplementary Angles: two angles whose measures add to 180˚.

Reflexive Property: any geometric figure is congruent to itself.

Midpoint: the point that divides a segment into two congruent segments.

Angle Bisector: a line that divides an angle into two congruent angles.

Triangle congruence: can be proven if SAS, ASA, SSS, AAS or HL.

CPCTC: the corresponding parts of congruent triangles are congruent.

acute angle	An angle whose measure is less than 90 degrees
adjacent angles	Two angles that share a ray, thereby being directly next to each other
alternate exterior angles	Angles located outside a set of parallel lines and on opposite sides of the transversal
alternate interior angles	Angles located inside a set of parallel lines and on opposite sides of the transversal
corresponding angles	Two angles in the same relative position on two lines when those lines are cut by a transversal
obtuse angle	An angle whose measure is greater than 90 degrees
right angle	An angle of 90 degrees
same side exterior angles	Angles located outside a set of parallel lines and on the same side of the transversal
same side interior angles	Angles located inside a set of parallel lines and on the same side of the transversal
vertical angles	The two nonadjacent angles formed when two straight lines intersect

Day 1: Matching Activity for Writing Equations of Lines

Properties

These lines are parallel	These lines are perpendicular
These lines have the same ***y*-intercept**	These lines have the same ***x*-intercept**
These lines go through the point (1,5)	

s

Card Set: Equations

	$4y = x + 3$
$y = 8x - 3$	$y + 4x + 6 = 0$
$3y = 2x - 8$	$y + 6x = 11$
$2y + 8 = 3x$	$2y + x = 4$
$2y = 8x + 3$	$y = 6x - 4$

Unit 2B Worksheet day 1 Name____________________

Writing Linear Equations

State the slope and y-intercept of the graph of each equation.

1. 5x – 4y = 8

2. 3x – y = -11

3. $\frac{2}{3}x + \frac{4}{7}y = 1$

4. 3y = 7

Find the slope-intercept form of each equation. (y = mx + b)

5. 3x – 4y = 15

6. 4x + 7y = 12

7. 9y = -15

8. 2x = -8

Write an equation for the line that satisfies each of the given conditions in slope-intercept form.

9. slope = -5, passes through (-3,-8)

10. slope = $\frac{4}{5}$, passes through (10, -3)

11. passes through(4,3) and (7,-2)

12. passes through(-6,-3) and (-8,4)

Write an equation for the line satisfying the following conditions in point slope form:

13. passes through(3,11) and (-6,5)

14. passes through(7,2) and (3,-5)

15. x-intercept = -5, y – intercept = -5

16. x-intercept = -5, y – intercept = 7

Write an equation in Standard form for the following lines:

17. parallel to y = -2x + 6, through (9,-3)

18. perpendicular to y = 2/3x – 5, through (-4, 7)

19. x intercept = 2 and parallel to y = 7

20. Passes through (3, -2) and (4,0)

Day 2: WS#1 Proving lines Parallel

1. If **corresponding angles** are congruent, then the lines are parallel.
2. If **alternate interior** angles are congruent, then the lines are parallel.
3. If **same side interior angles** are supplementary, then the lines are parallel.
4. If **alternate exterior** angles are congruent, then the lines are parallel.

I. State which segments (if any) must be parallel. Justify your answer with a statement from above. (you will need to use a separate piece of paper for 7-17)

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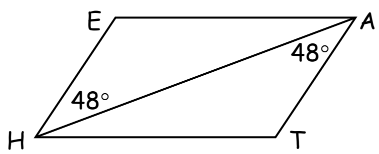

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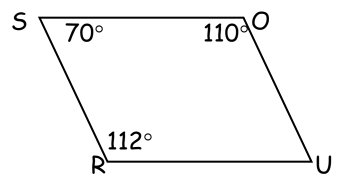

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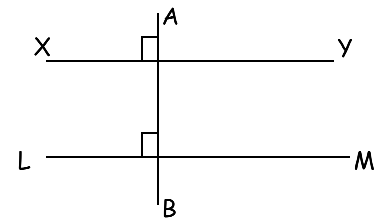

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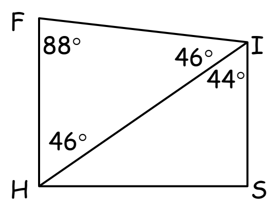

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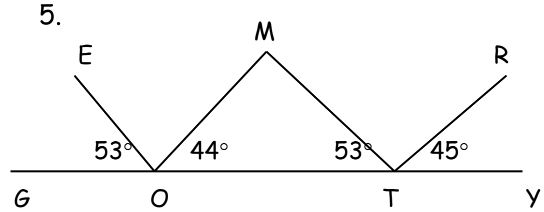

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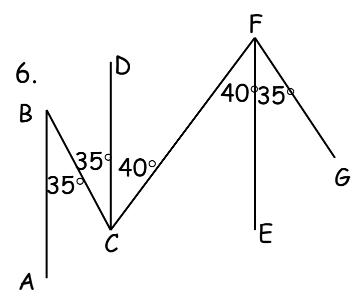
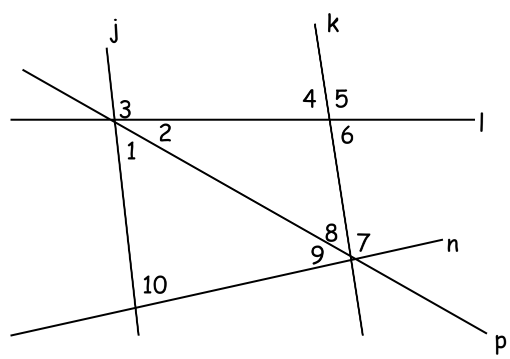


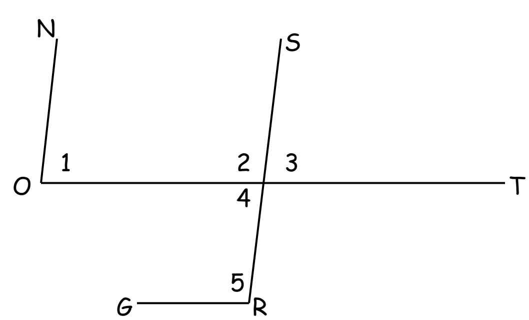
Name the type for each pair of angles

7. ∠1 ≅ ∠8
8. ∠4 ≅ ∠6
9. ∠10 ≅ ∠7
10. m∠3 + m∠4 = 180
11. ∠5 ≅ ∠3
12. ∠6 ≅ ∠7



Name the type for each pair of angles

13. ∠1 ≅ ∠3
14. ∠1 ≅ ∠4
15. ∠2 ≅ ∠5
16. ∠3 ≅ ∠5
17. ∠4 is supplementary to ∠5.



Day 2: WS#2 Parallel Line Practice

Find the measure of the indicated angle that makes lines u and v parallel.

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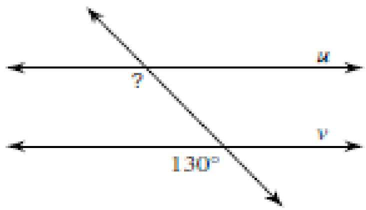

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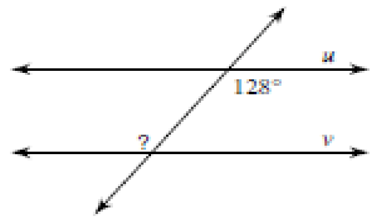

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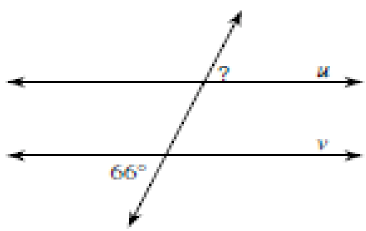

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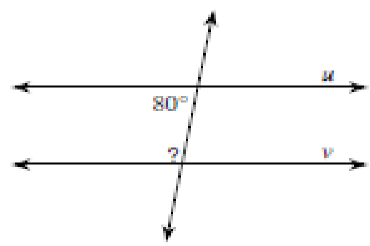

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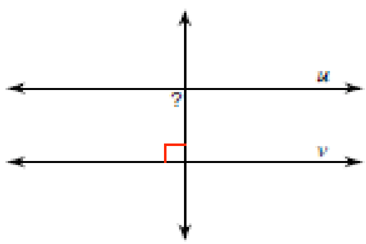

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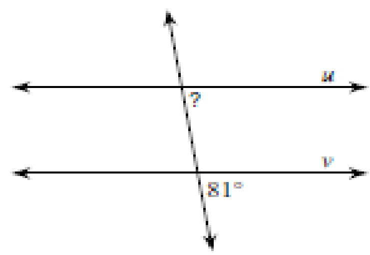

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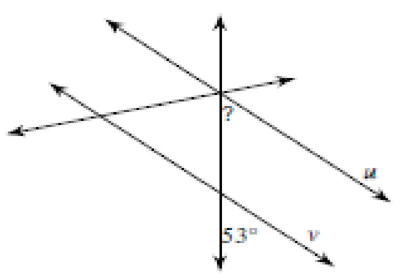

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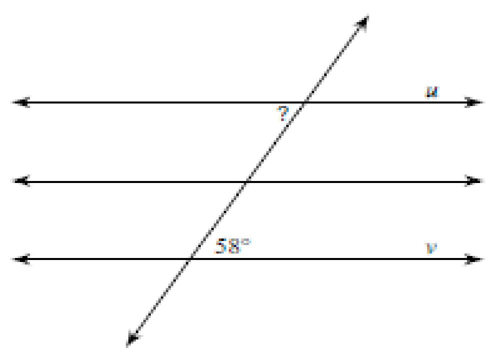

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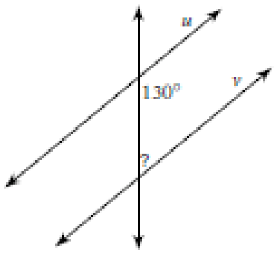

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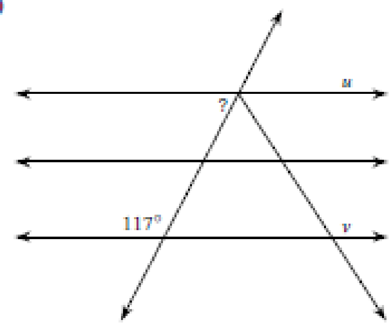
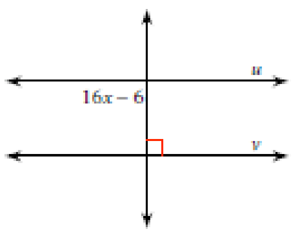


Find the value of x that makes lines u and v parallel.

11)



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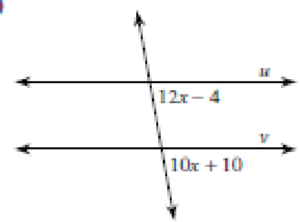

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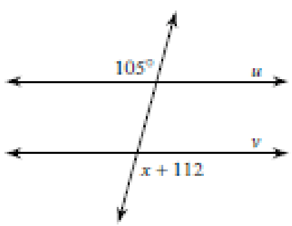

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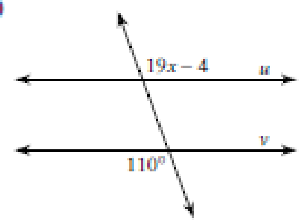

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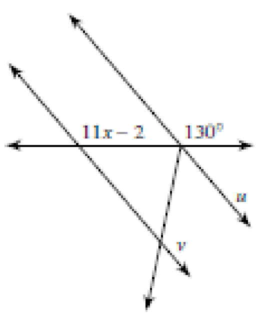

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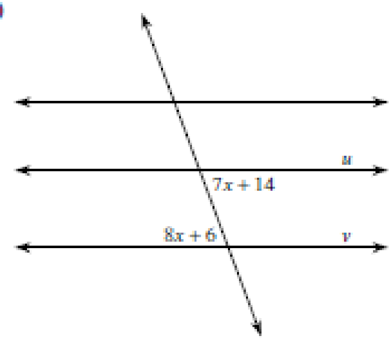


Critical thinking questions:

17) For question #16, find a value of x that makes lines u and v intersect.

18) Even if the lines in question #16 were not parallel, could $x = 25$? Why or why not?

Day 3: Introduction to Proofs -- "Getting Blood From a Stone"

The rules of writing a mathematical proof are very similar to the rules of "getting blood from a stone". The old saying "You can't get blood from a stone", means that nobody can give you anything that they, themselves, do not have.

The "rules of the game", and how these rules relate to mathematical proof:

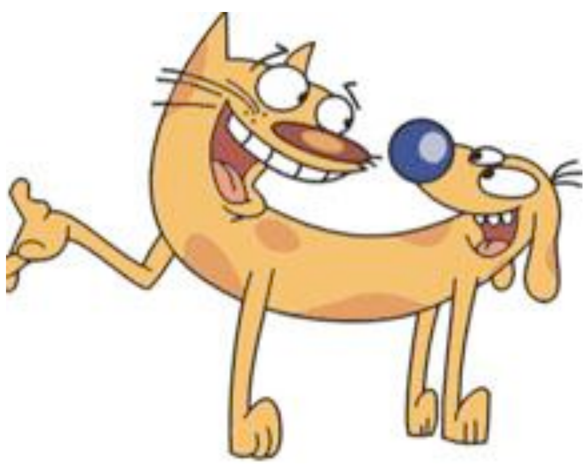
1) You must start with the first word and end up with the second word by a series of logical steps (much like the steps in a mathematical proof).

2) You must change one letter in each step. Each step must follow directly from the previous step, and it must make a real word found in the dictionary. (In a proof, each step must be true: a definition, postulate, or theorem). If you use an unusual word, you must write the definition.

3) In this game, different people may take a different number of steps to complete the process, and both can be correct. There is more than one route, and no one way is necessarily better than another. One may be longer, but the best one is the one is the one that the student "sees" when trying to do the problem! (This is very true of proof; there are dozens of proofs of the Pythagorean Theorem, for example!)

Example:

Can you go from the word CAT to the word DOG?



Here are some possible solutions to this problem:
Solution 1: CAT - BAT - BAG - BOG - DOG
Solution 2: CAT - COT - DOT - DOG

YOU TRY!
1. DOG to CAT. 2, HAT to COP 3. RED to BAT 4. SINK to RAFT

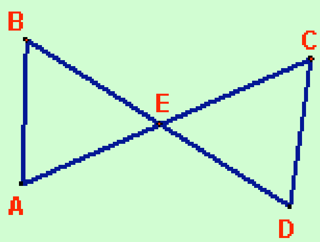
BONUS: Can you get "BLOOD from a STONE"???????

Day 3: Two Column Proof Examples

There are three classic styles for presenting proofs:

Method 1 — **The Two-Column Proof**
(also called the **T-Form proof** or **Ledger proof**)

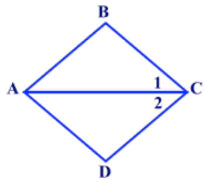
... this method is most often seen in high school textbooks. Two columns are presented where the first column contains a numbered chronological list of steps (*"statements"*) leading to the desired conclusion. The second column contains a list of *"reasons"* which support each step in the proof. These reasons are properties, theorems, postulates and definitions. This method of presentation helps you to clearly display each step in your argument, and helps you to keep your ideas organized.



Given: E is the midpoint of $\overline{BD}$
$\overline{AE} \cong \overline{EC}$
Prove: $\Delta AEB \cong \Delta CED$

STATEMENTS	REASONS
1. $\overline{AE} \cong \overline{EC}$	1. Given
2. $\measuredangle BEA \cong \measuredangle DEC$	2. Vertical angles are congruent.
3. $\overline{BE} \cong \overline{ED}$	3. Midpoint of a segment divides the segment into two congruent segments.
4. $\Delta AEB \cong \Delta CED$	4. SAS $\cong$ SAS If two sides and the included angle of one triangle are congruent to the corresponding parts of another triangle, the triangles are congruent.

1.



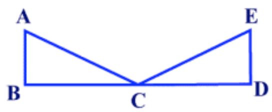
Given: $\overline{BC} \cong \overline{CD}$

$\overline{AC}$ bisects $\angle BCD$

Prove: $\Delta ABC \cong \Delta ADC$

Proof

2.



Given: $\overline{AB} \cong \overline{ED}$

C is midpoint $\overline{BD}$

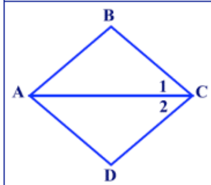
$\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$

Prove: $\Delta ABC \cong \Delta EDC$

Proof

www.regentsprep.org/Regents/math/geometry/GP4/ans1.htm

Question #1



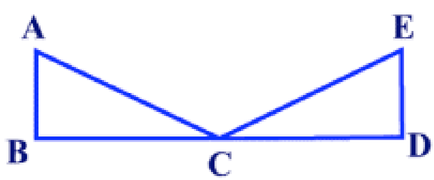
Given: $\overline{BC} \cong \overline{CD}$

$\overline{AC}$ bisects $\angle BCD$

Prove: $\Delta ABC \cong \Delta ADC$

Statements	Reasons
1. $\overline{BC} \cong \overline{CD}$	1. Given
2. $\angle 1 \cong \angle 2$	2. An angle bisector is a ray whose endpoint is the vertex of the angle and divides the angle into two congruent angles.
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive Property (a quantity is congruent to itself)
4. $\Delta ABC \cong \Delta ADC$	4. (SAS) If two sides and the included angle of one triangle are congruent to the corresponding parts of a second triangle, the triangles are congruent.

Question #2



Given: $\overline{AB} \cong \overline{ED}$

C is midpoint $\overline{BD}$

$\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$

Prove: $\Delta ABC \cong \Delta EDC$

Statements	Reasons
1. $\overline{AB} \cong \overline{ED}$ C is midpoint $\overline{BD}$ $\overline{AB} \perp \overline{BD}$; $\overline{ED} \perp \overline{BD}$	1. Given
2. $\angle B, \angle D$ right angles	2. Perpendicular lines meet to form right angles.
3. $\angle B \cong \angle D$	3. Right angles are congruent.
4. $\overline{BC} \cong \overline{DC}$	4. Midpoint of a line segment is the point on that line segment that divide the segment into two congruent segments.
5. $\Delta ABC \cong \Delta EDC$	5. (SAS) If two sides and the includ angle of one triangle are congruent t the corresponding parts of a second triangle, the triangles are congruent.

Day 3: Group Proof Activity

Please re-arrange the steps and match them with the correct reasons in order to have this proof PERFECT ☺

GEOMETRY 5-2 NAME:____________________

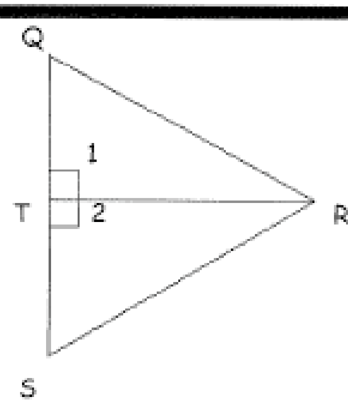
SCRAMBLED PROOF

GIVEN:

$\overline{RT}$ bisects ∠QRS

$\overline{RT} \perp \overline{QS}$

PROVE: $\overline{QR} \cong \overline{SR}$



∠1 ≅ ∠2	ASA
△QTR ≅ △STR	CPCTC
$\overline{RT} \cong \overline{RT}$	Given
$\overline{RT}$ bisects ∠QRS	If 2 lines are perpendicular, then they form four right angles.
∠1 & ∠2 are right angles	If two angles are right angles, then they are congruent.
∠4 ≅ ∠3	Given
$\overline{RT} \perp \overline{QS}$	If an angle is bisected, then it is divided into 2 congruent angles.
$\overline{QR} \cong \overline{SR}$	Reflexive

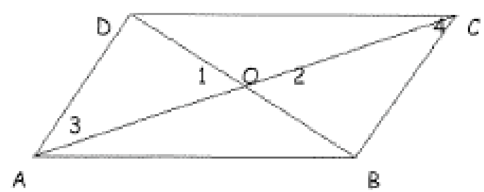
Day 3 HOMEWORK Re-arrange the steps and reasons in order for this proof to make sense ☺

GEOMETRY 5-1 NAME:____________________

SCRAMBLED PROOF

GIVEN: $\overline{AC}$ & $\overline{BD}$ bisect each other

PROVE: $\angle 3 \cong \angle 4$



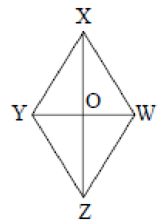
$\Delta AOD \cong \Delta COB$	CPCTC
$\angle 1 \cong \angle 2$	SAS
$\angle 3 \cong \angle 4$	Vertical angles are congruent
$\overline{AC}$ & $\overline{BD}$ bisect each other	Given
$\overline{AO} \cong \overline{CO}$ $\overline{BO} \cong \overline{DO}$	If a segment bisects another segment, it passes through its midpoint.
O is the midpoint of $\overline{AC}$ & $\overline{BD}$	If a point is a midpoint, then it divides the segment into two congruent segments.

Day 3: WS#3 Two Column Proof Practice

1. Mark the given information on the diagram. Give a reason for each step in the two-column proof. Choose the reason for each statement from the list below.

Given: $\overline{YX} \cong \overline{WX}$
$\overline{ZX}$ bisects $\angle YXW$

Prove: $\overline{YZ} \cong \overline{WZ}$



Statement	Reason
1. $\overline{YX} \cong \overline{WX}$	1.
2. $\overline{ZX}$ bisects $\angle YXW$	2.
3. $\angle YXZ \cong \angle WXZ$	3.
4. $\overline{XZ} \cong \overline{XZ}$	4.
5. $\Delta YXZ \cong \Delta WXZ$	5.
6. $\overline{YZ} \cong \overline{WZ}$	6.

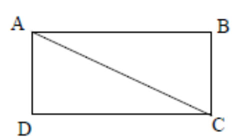
Choose a reason from this list:

Definition of angle bisector
Definition of congruent triangles or CPCTC
Given
Given
Reflexive property of congruence
Side-Angle-Side congruence

2. Mark the given information on the diagram. Give a reason for each step in the two-column proof. Choose the reason for each statement from the list below.

Given: $\overline{AD} \cong \overline{BC}$
$\overline{AB} \cong \overline{DC}$

Prove: $\overline{AD} \parallel \overline{BC}$



Statement	Reason
1. $\overline{AD} \cong \overline{BC}$	1.
2. $\overline{AB} \cong \overline{DC}$	2.
3. $\overline{AC} \cong \overline{AC}$	3.
4. $\Delta CAD \cong \Delta ACB$	4.
5. $\angle DAC \cong \angle BCA$	5.
6. $\overline{AD} \parallel \overline{BC}$	6.

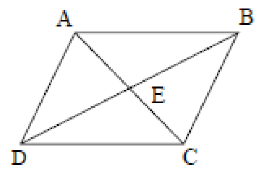
Choose a reason from this list:

Definition of congruent triangles
Given
Given
If alternate interior angles are congruent then the lines are parallel.
Reflexive property of congruence
Side-Side-Side congruence

3. Complete the following proof by filling in each statement. Remember to mark all given information on the diagram.

Given: ABCD is a parallelogram

Prove: $\triangle ABE \cong \triangle CDE$



Statement	Reason
1.	1. Given
2.	2. In a parallelogram, opposite sides are congruent.
3.	3. In a parallelogram, diagonals bisect each other.
4.	4. In a parallelogram, diagonals bisect each other.
5.	5. Side-Side-Side congruence

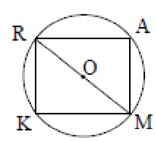
Choose a statement from this list:

$\overline{AE} \cong \overline{EC}$
ABCD is a parallelogram
$\overline{DE} \cong \overline{EB}$
$\triangle ABE \cong \triangle CDE$
$\overline{AB} \cong \overline{DC}$

5. Complete the following proof.

Given: $\overline{MR}$ is a diameter of $\odot$ O
$\overline{AR} \cong \overline{MK}$

Prove: $\triangle MAR \cong \triangle RKM$



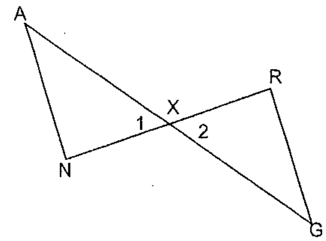
Statement	Reason
1. $\overline{MR}$ is a diameter of $\odot$ O	1.
2. $\overset{\frown}{MAR}$ and $\overset{\frown}{MKR}$ are semicircles	2.
3. $\angle MAR$ and $\angle MKR$ are right angles	3.
4. $\angle MAR \cong \angle MKR$	4.
5. $\overline{MR} \cong \overline{MR}$	5.
6. $\overline{AR} \cong \overline{MK}$	6.
7. $\triangle MAR \cong \triangle RKM$	7.

Choose from this list of reasons.

An angle inscribed in a semicircle is a right angle.
All right angles are congruent
Definition of a semicircle
Given
Given
Hypotenuse-Leg Congruence
Reflexive property of congruence

Day 3: Two Column Proof Practice WS#4

#1



17. Complete the following proof.

Given: X is the midpoint of $\overline{AG}$ and $\overline{NR}$

Prove: $\angle N \cong \angle R$

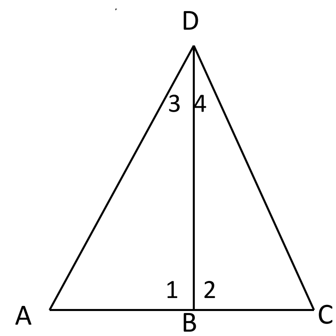
Statements	Reasons
a. ______________________	a. ______________________
b. $\angle 1 \cong \angle 2$	b. ______________________
c. ______________________ ______________________	c. definition of midpoint
d. $\triangle ANX \cong$ ______________	d. ______________________
e. ______________________	e. ______________________

#2

Given: $\overline{AC} \perp \overline{BD}$

$\overline{BD}$ bisects $\angle ADC$

Prove: $\overline{AB} \cong \overline{CB}$



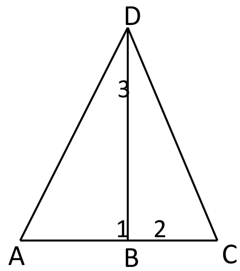
1. $\overline{AC} \perp \overline{BD}$	1. ______________________
2. $\angle 1$ & $\angle 2$ are right $\angle$'s	2. ______________________
3. $\angle 1 \cong \angle 2$	3. ______________________
4. $\overline{BD} \cong \overline{BD}$	4. ______________________
5. $\overline{BD}$ bisects $\angle ADC$	5. ______________________
6. $\angle 3 \cong \angle 4$	6. ______________________
7. $\Delta ADB \cong \Delta CDB$	7. ______________________
8. $\overline{AB} \cong \overline{CB}$	8. ______________________

#3

Given: $\overline{AC} \perp \overline{BD}$

$\angle A \cong \angle C$

Prove: $\angle 3 \cong \angle 4$



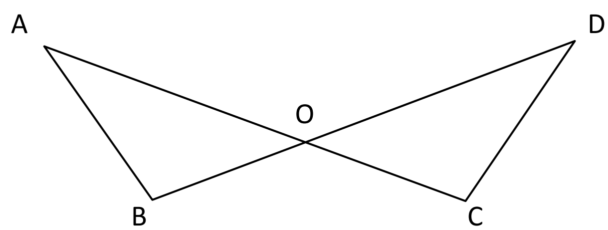
1. $\overline{AC} \perp \overline{BD}$	1. ______________________
2. $\angle 1$ & $\angle 2$ are right $\angle$'s	2. ______________________
3. $\angle A \cong \angle C$	3. ______________________
4. $\angle 1 \cong \angle 2$	4. ______________________
5. $\overline{BD} \cong \overline{BD}$	5. ______________________
6. $\Delta ADB \cong \Delta CDB$	6. ______________________
7. $\angle 3 \cong \angle 4$	7. ______________________

#4

Given: $\overline{BO} \cong \overline{CO}$; $\overline{AO} \cong \overline{DO}$

Prove: $\angle B \cong \angle C$

PROOF:

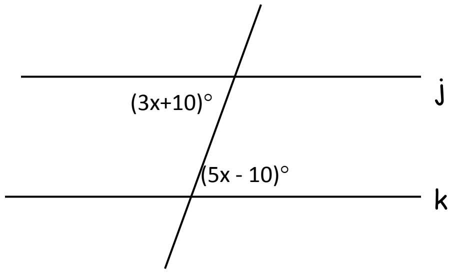


1. $\overline{BO} \cong \overline{CO}$; $\overline{AO} \cong \overline{DO}$	1. GIVEN
2. $\angle AOB \cong \angle DOC$	2. ______________________
3. $\Delta ABO \cong \Delta DCO$	3. ______________________
4. $\angle B \cong \angle C$	4. ______________________

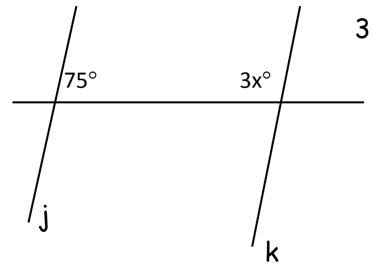
Day 4: WS#5

. Find the value of x that makes j // k.

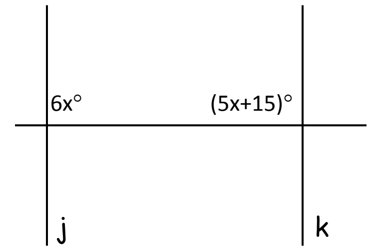
1.



2.

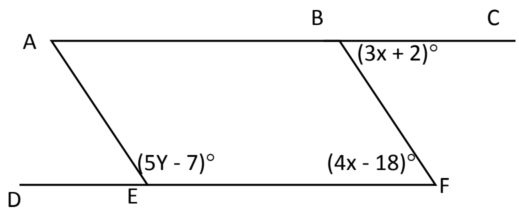


3.

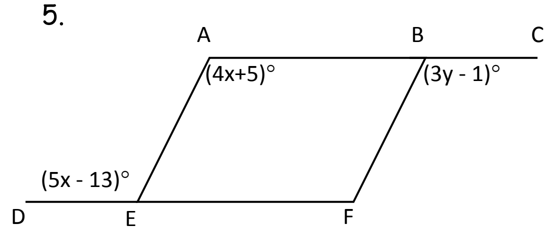


III. Find the values of x and y that make $\overline{AC} \parallel \overline{DF}$ and $\overline{AE} \parallel \overline{BF}$.

4.

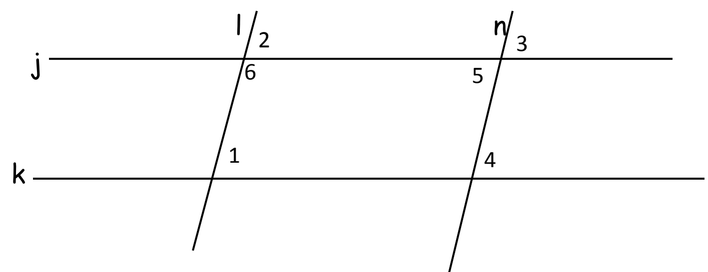


5.



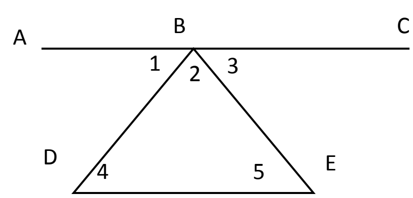
IV. Proofs - Fill in the appropriate reasons.

6. Given j // k; $\angle 1 \cong \angle 3$
   Prove: l // n



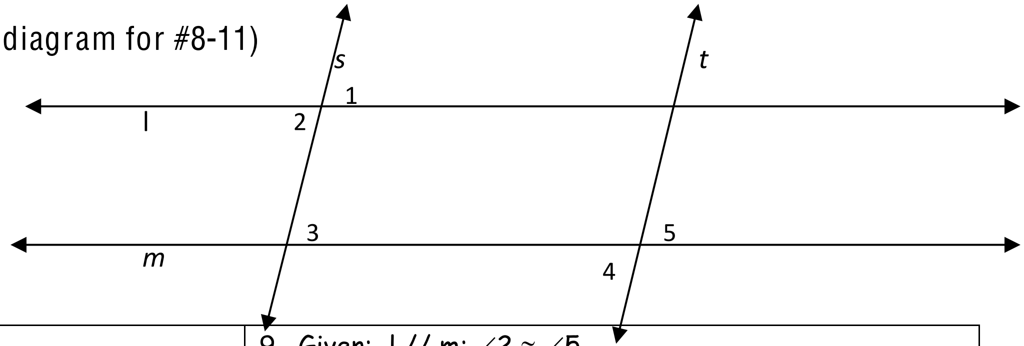
1. j // k ; $\angle 1 \cong \angle 3$	1.
2. $\angle 2 \cong \angle 1$	2.
3. $\angle 2 \cong \angle 3$	3.
4. l // n	4.

7. Given: $\angle 2 \cong \angle 5$; $\overrightarrow{BE}$ bisects $\angle$ CBD.
   Prove: $\overline{AC} \parallel \overline{DE}$



1. $\angle 2 \cong \angle 5$; $\overrightarrow{BE}$ bisects $\angle$ CBD.	1.
2. $\angle 3 \cong \angle 2$	2.
3. $\angle 3 \cong \angle 5$	3.
4. $\overline{AC} \parallel \overline{DE}$	4.

Proofs involving parallel lines (use diagram for #8-11)



8. Given: l // m; $\angle 1 \cong \angle 4$
Prove: s // t

1. l // m ; $\angle 1 \cong \angle 4$ 1. ______________________
2. $\angle 3 \cong \angle 1$ 2. ______________________
3. $\angle 3 \cong \angle 4$ 3. ______________________
4. s // t 4. ______________________

9. Given: l // m; $\angle 2 \cong \angle 5$
Prove: s // t

1. l // m ; $\angle 2 \cong \angle 5$ 1. ______________________
2. $\angle 2 \cong \angle 3$ 2. ______________________
3. $\angle 3 \cong \angle 5$ 3. ______________________
4. s // t 4. ______________________

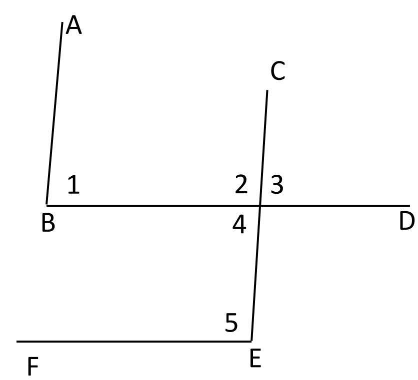
10. Given: l // m; s // t
Prove: $\angle 2 \cong \angle 4$

1. l // m ; s // t 1. ______________________
2. $\angle 2 \cong \angle 3$, $\angle 3 \cong \angle 4$ 2. ______________________
3. $\angle 2 \cong \angle 4$ 3. ______________________

11. Given: l // m; s // t
Prove: $\angle 1 \cong \angle 5$

1. l // m; s // t 1. ______________________
2. $\angle 1 \cong \angle 3$, $\angle 3 \cong \angle 5$ 2. ______________________
3. $\angle 1 \cong \angle 5$ 3. ______________________

12. Given: $\angle 3$ is supplementary to $\angle 5$.
Prove: $\overline{BD} \parallel \overline{FE}$



1. $\angle 3$ is supplementary to $\angle 5$ 1.
2. $m\angle 3 + m\angle 5 = 180$ 2.
3. $\angle 3 \cong \angle 4$ 3.
4. $m\angle 3 = m\angle 4$ 4.
5. $m\angle 4 + m\angle 5 = 180$ 5.
6. $\angle 4$ is supplementary to $\angle 5$ 6.
7. $\overline{BD} \parallel \overline{FE}$ **7.**

Day 4 HOMEWORK : WS #6 Proof Practice

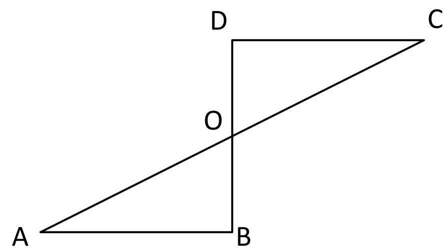
1.) Congruence Statement: $\triangle RED \cong \triangle FOX$

List the corresponding $\angle$'s: corresponding sides:

$\angle R \cong$ ___ $\overline{RE} \cong$ ____

$\angle E \cong$ ___ $\overline{ED} \cong$ ____

$\angle D \cong$ ___ $\overline{RD} \cong$ ____

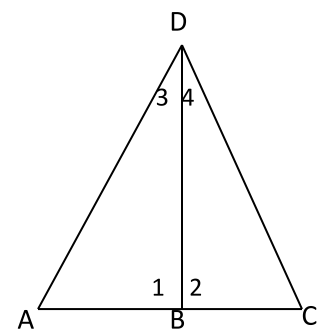


Examples:

2.) The two $\triangle$'s shown are $\cong$.

a) $\triangle ABO \cong$ ______ b) $\angle A \cong$ _____

c) $\overline{AO} \cong$ ______ d) BO = _____



3.) Given: $\overline{AB} \cong \overline{CB}$

$\overline{AC} \perp \overline{BD}$

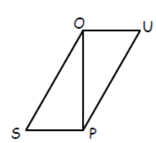
Prove: $\triangle ADB \cong \triangle CDB$

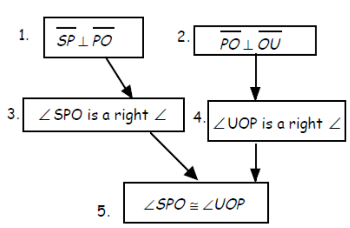
4.)

2.) Given: $\overline{SP} \perp \overline{PO}$

$\overline{PO} \perp \overline{OU}$

Prove: $\angle SPO \cong \angle UOP$





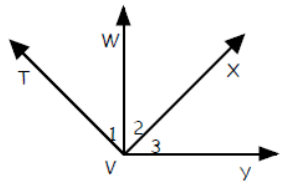
Reasons:

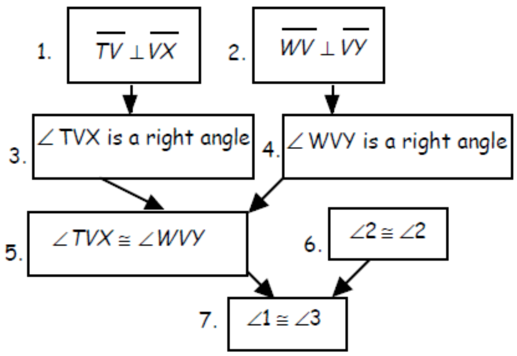
1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________

2.) Given: $\overline{TV} \perp \overline{VX}$

$\overline{WV} \perp \overline{VY}$

Prove: $\angle 1 \cong \angle 3$





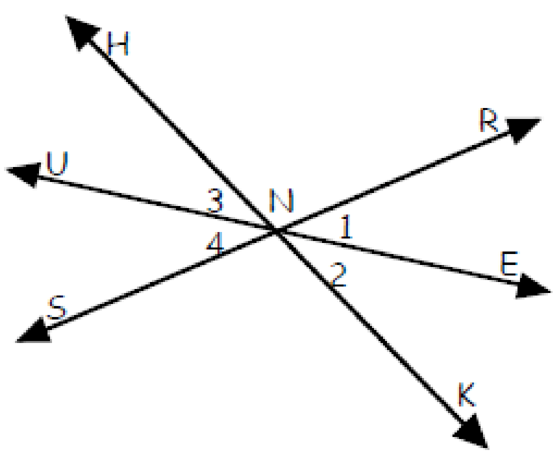
Reasons:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________

2.) Given: $\overrightarrow{NE}$ bisects $\angle RNK$

Prove: $\angle 3 \cong \angle 4$

(hint: 5 steps)



Exit Ticket Suggestions – Lesson 3

1. There are five ways to prove that lines are parallel. Which of the methods below is not one of these five methods?

(A) Demonstrate congruence of a pair of corresponding angles
(B) Demonstrate congruence of a pair of alternate interior angles
(C) Demonstrate that a pair of interior angles on opposite sides is supplementary
(D) Demonstrate that both lines are perpendicular to a third

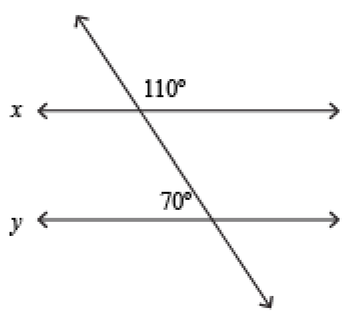
2. What is the definition of complementary angles?

(A) Two angles that add up to 180°
(B) Two angles that add up to 90°
(C) Two angles that are congruent
(D) Two angles that share one side

3. Two lines intersect, forming two pairs of vertical angles. One of these angles is 140° in measure. What are the measures of the three remaining angles?

(A) 40°, 90°, 90°
(B) 40°, 40°, 40°
(C) 40°, 40°, 140°
(D) 60°, 70°, 70°

4. If we want to prove that *x* and *y* are parallel using the alternate exterior angle theorem, which additional piece of information would we need to include for this particular situation?

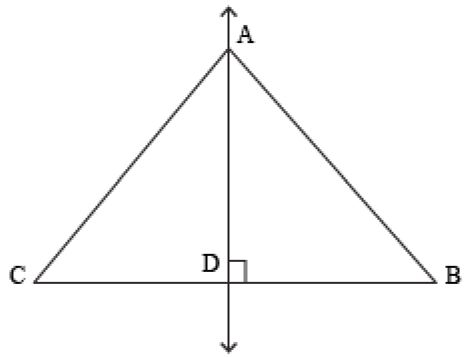


(A) The parallel postulate
(B) The alternate interior angles theorem
(C) The definition of supplementary angles
(D) The vertical angles theorem

5. A transversal intersects two parallel lines. Which of the following is *not* true?

(A) Alternate interior angles are congruent
(B) Corresponding angles are supplementary
(C) Interior angles on the same side are supplementary
(D) Alternate exterior angles are congruent

6. If *AD* is a perpendicular bisector of *CB*, what can we use to prove that *AC* is congruent to *AB*?



(A) Triangle sum theorem
(B) SAS postulate, then CPCTC
(C) SSS postulate, then CPCTC
(D) Vertical angles theorem

7. Which of the following angles cannot be assumed without a specific mark in a figure?

(A) A 180° angle
(B) A 90° angle
(C) A pair of vertical angles
(D) None of the above

8. What is the supplement of the complement of 30°?

(A) 120°
(B) 90°
(C) 60°
(D) 30°

9. Which of the following is always true about an angle bisector?

(A) It splits an angle into two complementary angles
(B) It splits an angle into two supplementary angles
(C) It splits an angle into two corresponding angles
(D) It splits an angle into two congruent angles

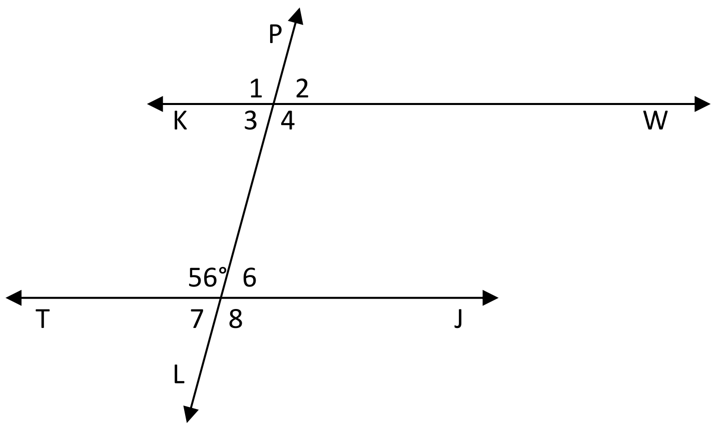
10. Which of the following is not necessarily true about perpendicular line segments?

(A) They create two pairs of vertical angles
(B) Their intersection point creates a right angle
(C)One line is a perpendicular bisector of the other

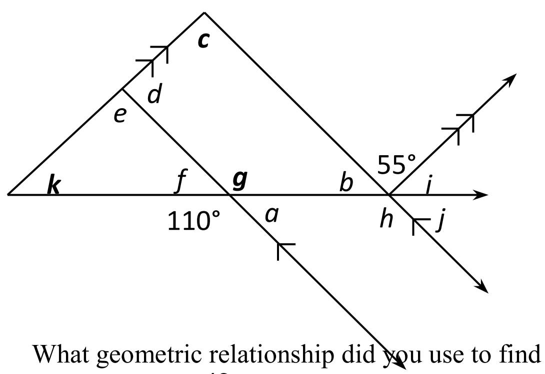
11. KW II TJ, LP intersects KW and TJ

Find m < 2

Find m < 4



12. a. Find the measure of each angle in the diagram.



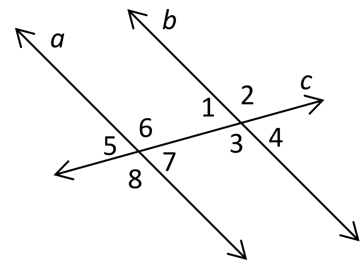
b. What geometric relationship did you use to find angles *c*, *g*, and *k*?

Explanation for ∠*c*:

Explanation for ∠*g*:

Explanation for ∠*k*:

13.



Use the diagram to answer the questions below.

a. If angle 1 and angle 7 are congruent, what property proves the lines are parallel?

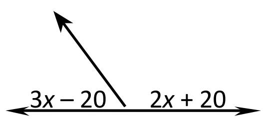
b. If angle 5 and angle 8 are congruent, what can be concluded about the lines?

c. If the lines are parallel, what must be true about angle 2 and angle 6? What is the name of the property used to determine this?

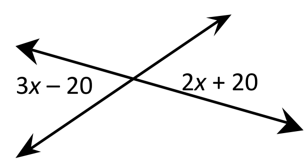
d. If the lines are parallel, what must be true about angle 7 and angle 3? What is the name of the property used to determine this?

14.. Set up and solve an equation to solve for x in each diagram.

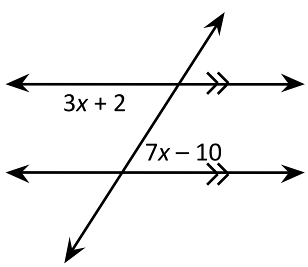
a)



b)



c)



d)