		Math 2 Honors
Day	**Date**	**Unit 5 Topics**
1	4/09/18	L1: Key Vocabulary
2	4/10	L2: Parallel Lines & Transversals
3	4/11	L3: Triangle Theorems
4	4/12	L4: Midsegment Theorem
5	4/13	**QUIZ #1** on Lessons 1-4
6	4/16	L5: Triangle Proportionality Theorem
7	4/17	L6: Similar Triangles
8	4/18	L7: Similar Triangle Proofs (Flow)
9	4/19	L7: More Proofs (2 column)
10	4/20	**QUIZ #2**
11	4/23	Review for Test
12	4/24	**TEST on Unit 5**

QUIZ DATES: _____ & _____ **TEST DATE:** _____

Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 1 → Introduction to Key Vocabulary

Name_____
Date_____ **Pd**_____

Picture This.....draw an example in each box.

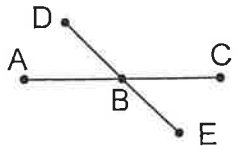
Congruent Segments: Segments whose *lengths are equal.*	**Midpoint:** A point that divides a segment into *2 congruent segments.*
Segment Bisector: A line (or part of a line) that intersects the segment at its *midpoint.*	**Congruent Angles:** Angles whose *measures are equal.*
Angle Bisector: A ray that divides an angle into *2 congruent angles.*	**Right Angle:** Angle whose measure is 90° **THEOREM: All right angles** are *congruent.*
Perpendicular Lines: Lines (or parts of lines) that intersect to form a *right angle.*	**Perpendicular Bisector:** Line (or part of a line) that is *perpendicular* to a segment at its *midpoint.*
Vertical angles: Two nonadjacent angles formed by 2 intersecting lines. **THEOREM: Vertical Angles** are *congruent.*	**Complementary angles:** Two angles whose *measures* have a *sum is* 90°
Supplementary angles: Two angles whose *measures* have a *sum is* 180°	**Linear pair:** Two adjacent angles whose non-common sides are opposite rays. **POSTULATE: Linear Pairs** are *supplementary.*
Reflexive Property of Congruence: A geometric figure is *congruent to itself.*	**Transitive Property of Congruence:** If *one* geometric figure is congruent to a *second* geometric figure and the *second* geometric figure is congruent to a *third* geometric figure, then the *first* and *third* figures are *congruent.*

I say (or see) ...	You say...	By...
$\cong$ Segments		
Midpoint		
Segment Bisector		
$\cong$ Angles ($\angle's$)		
Angle Bisector		
Perpendicular ($\perp$) Lines		
Right Angle		
2 Right Angles		
Perpendicular Bisector		
Vertical Angles		
Complementary Angles		
Supplementary Angles		
Linear Pair		
Shared **Angle**		
Shared **Side**		
$\angle A \cong \angle B \ \ and \ \ \angle B \cong \angle C$		
ΔABC has a right angle		

$\overline{TO} \cong \overline{AD}$

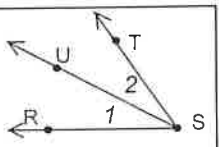
$\angle 4 \cong \angle 5$

I is the midpoint of $\overline{MD}$

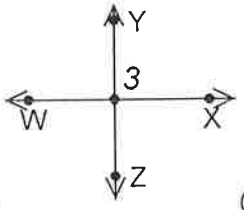


$\overline{DE}$ *bisects* $\overline{AC}$

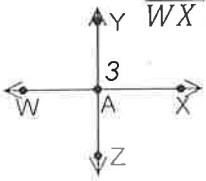
$\overline{SU}$ *bisects* $\angle RST$



$\overleftrightarrow{WX} \perp \overleftrightarrow{YZ}$

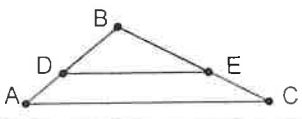


$\overline{WX}$ *is the perpendicular bisector of* $\overline{YZ}$



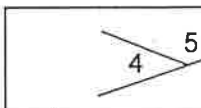
OR

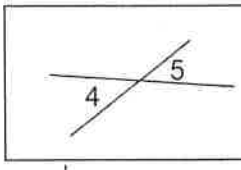
What do you know about $\angle B$?



$\angle L$ and $\angle E$ are supplementary

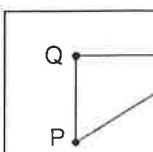
$\angle L$ and $\angle E$ are complementary





$\angle H$ is a right angle

$\angle C$ and $\angle D$ are right angles



$\angle Q$ is right

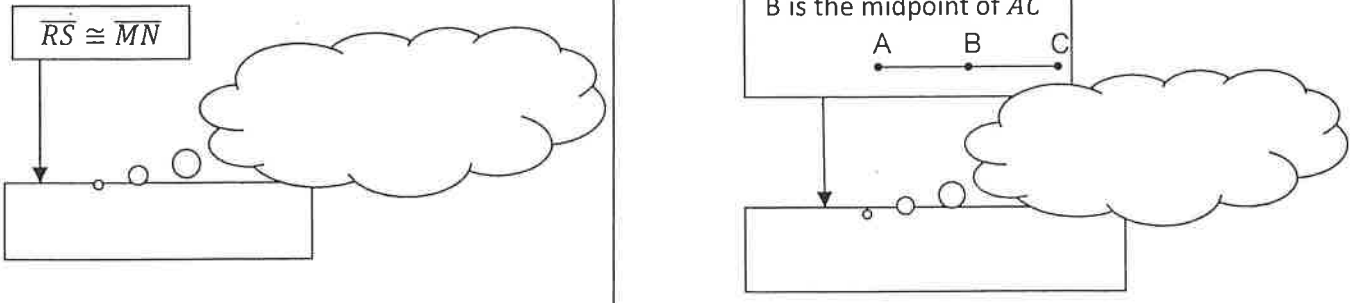
$\angle 5 \cong \angle 8$ and $\angle 8 \cong \angle 4$

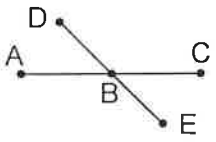
Math 2 – Honors
Unit 5 – Triangles & Similarity
Lesson 1 → Introduction to Key Vocabulary HOMEWORK

Name_____
Date_____Pd_____

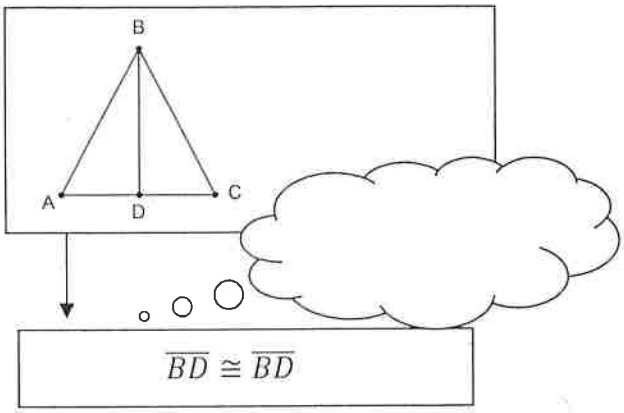
$\overline{RS} \cong \overline{MN}$

B is the midpoint of $\overline{AC}$





$\overline{DE}$ bisects $\overline{AC}$



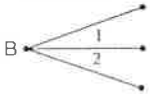
$\overline{BD} \cong \overline{BD}$

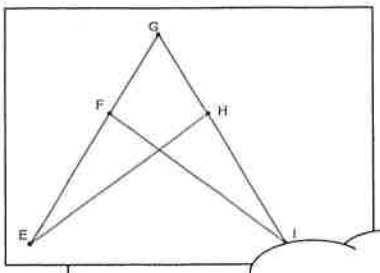
M is the midpoint to $\overline{LN}$

$\angle S$ is right

$\angle T \cong \angle R$

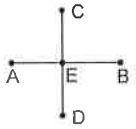
$\overrightarrow{BD}$ bisects $\angle ABC$





$\angle G \cong \angle G$

$\overline{CD}$ *is the perpendicular bisector of* $\overline{AB}$

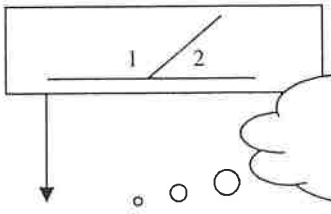


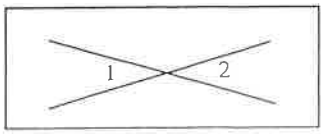
OR

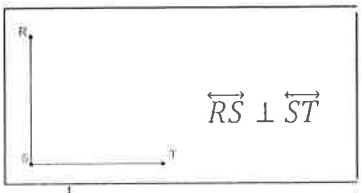
$\angle 1$ *and* $\angle 2$ *are supplementary*

$\angle 1$ *and* $\angle 2$ *are complementary*

$\angle 1$ and $\angle 2$ are right angles



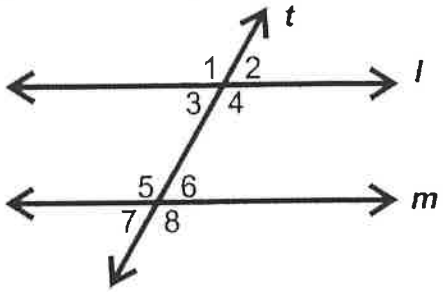




$\overleftrightarrow{RS} \perp \overleftrightarrow{ST}$

Math 2 – Honors
Unit 5 – Triangles & Similarity
Lesson 2 → Parallel Lines and Angle Relationships

Name_____
Date_____Pd_____



$l \parallel m$ *and* t *is a transversal*

There are names for the special angle pairs in the diagram above.

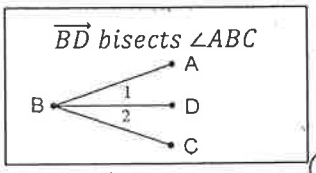
- Angles on the same side of the transversal where one is on the outside of the parallel lines and the other non-adjacent angle is between the parallel lines are called: ***corresponding angles***.
  - ✓ Corresponding angles are ***congruent***.
  - ✓ Name the pairs of corresponding angles: _____
- Angles on the opposite side of the transversal that are between the parallel lines that are not adjacent to each other are called: ***alternate interior angles***.
  - ✓ Alternate Interior angles are ***congruent***.
  - ✓ Name the pairs of alternate interior angles: _____
- Angles on the opposite side of the transversal that are not between the parallel lines are called: ***alternate exterior angles***.
  - ✓ Alternate Exterior angles are ***congruent***.
  - ✓ Name the pairs of alternate exterior angles: _____
- Opposite angles made by two intersecting lines are called: ***vertical angles***.
  - ✓ Vertical angles are ***congruent***.
  - ✓ Name the pairs of vertical angles: _____
- Angles on the same side of the transversal that are between the parallel lines are called: ***consecutive or same – side interior angles***.
  - ✓ Consecutive Interior angles are ***supplementary***.
  - ✓ Name the pairs of consecutive interior angles: _____
- Angles that are adjacent and form a line are called a ***linear pair***.
  - ✓ Linear Pair angles are ***supplementary***.
  - ✓ Name the linear pairs: _____

➢ The **converse** of a theorem is formed by interchanging what is given with what you are trying prove.

Ex#1:
Theorem: If ΔABC is a right triangle with $\angle C$ as the right angle, then $a^2 + b^2 = c^2$
Converse: If $a^2 + b^2 = c^2$, then ΔABC is a right triangle with $\angle C$ as the right angle.

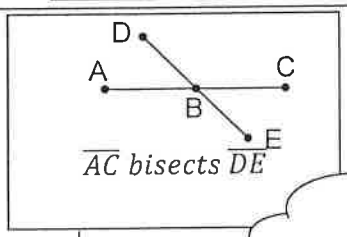
Ex#2:
Theorem: If 2 parallel lines are cut by a transversal, then alternate interior angles are congruent.
Converse: If alternate interior angles are congruent, then the two lines cut by the transversal are parallel.

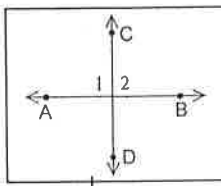
Complete the following responses and permissions.



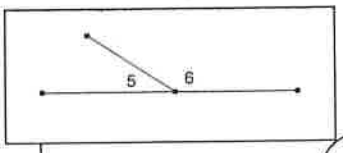
B is the midpoint of $\overline{PJ}$

P _____ B _____ J

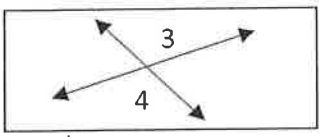


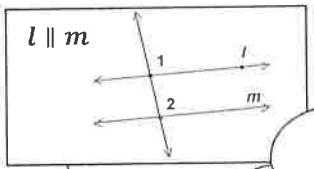


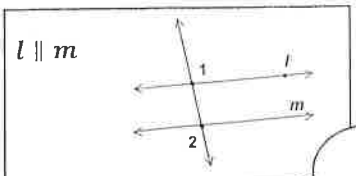
$\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$

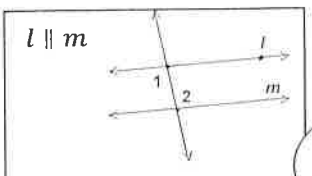


$\angle U$ and $\angle W$ are right angles





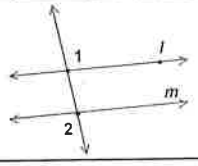




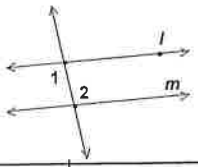
$\angle R$ and $\angle S$ are **supplementary**

$\angle X$ and $\angle Y$ are **complementary**

$\angle 1 \cong \angle 2$

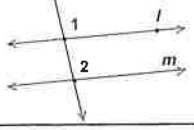


$\angle 1 \cong \angle 2$

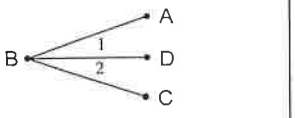


$\overline{AB} \cong \overline{BC}$

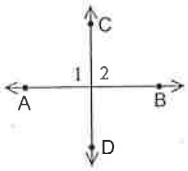
$\angle 1 \cong \angle 2$



$\angle 1 \cong \angle 2$

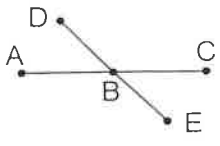


$\angle 1$ & $\angle 2$ are right angles

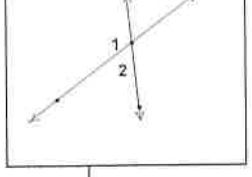


$\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$

$\overline{AB} \cong \overline{BC}$



B is the midpoint of $\overline{AC}$



Math 2 – Honors
Unit 5 – Triangles & Similarity
Lesson 2 → Parallel Lines and Angle Relationships HOMEWORK

Name_____
Date_____Pd_____

I. Identifying Angles: Use the diagram below.

1. Given the figure, name a pair of **alternate interior angles** for

   a. $\mathcal{L}_1 and\ \mathcal{L}_2$

   b. $\mathcal{L}_2 and\ \mathcal{L}_3$

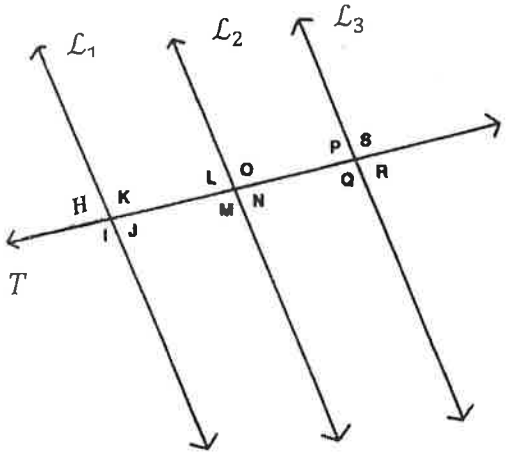
   c. $\mathcal{L}_1 and\ \mathcal{L}_3$

2. Given the figure, name a pair of **alternate exterior angles** for

   a. $\mathcal{L}_1 and\ \mathcal{L}_2$

   b. $\mathcal{L}_2 and\ \mathcal{L}_3$

   c. $\mathcal{L}_1 and\ \mathcal{L}_3$



3. Name an angle that forms a **corresponding angle pair** with $\angle M$ using

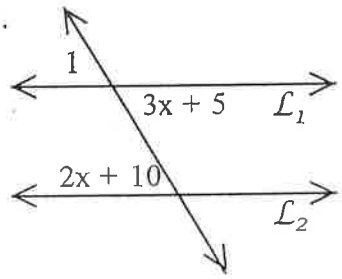
   a. $\mathcal{L}_1 and\ \mathcal{L}_2$

   b. $\mathcal{L}_2 and\ \mathcal{L}_3$

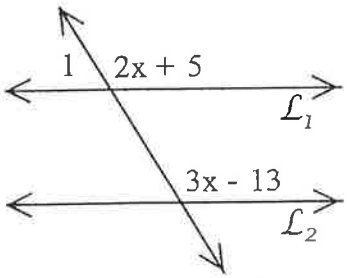
II. Solve:

4. If $\mathcal{L}_1 \parallel \mathcal{L}_2$, find $m\angle 1$.

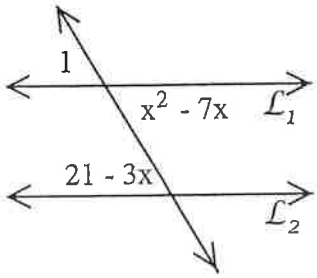
a.



b.

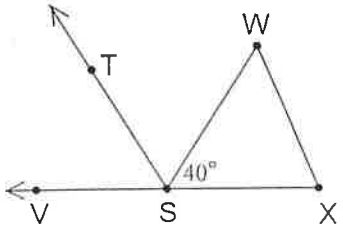


c.



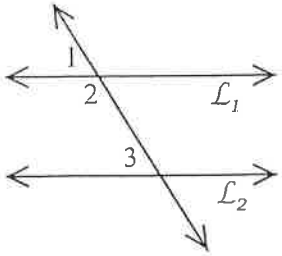
5. $\overline{ST} \parallel \overline{XW}$
   $\overrightarrow{ST}$ bisects $\angle VSW$

   Find $m\angle X$.

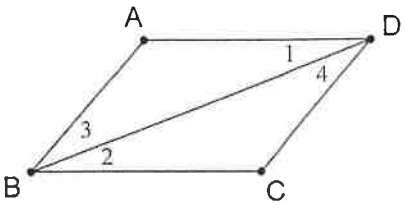


6. Given: $\mathcal{L}_1 \parallel \mathcal{L}_2$
   $m\angle 1 = (x + 3y)°$
   $m\angle 2 = (2x + 30)°$
   $m\angle 3 = (5y + 20)°$

   Find $m\angle 1$.



III. Use Figure $ABCD$.



7. Name three lines that determine:

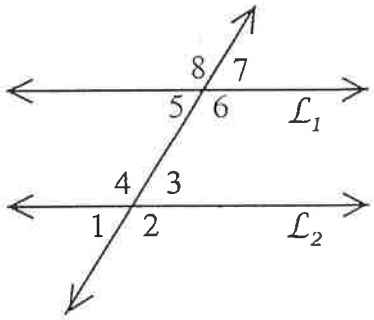
   A. $\angle 3$ and $\angle 4$ as alternate interior angles:

   _____ ∥ _____ *with* _____ *as the transversal*

   B. $\angle 1$ and $\angle 2$ as alternate interior angles:

   _____ ∥ _____ *with* _____ *as the transversal*

IV. Given: $\mathcal{L}_1 \parallel \mathcal{L}_2$



8. $m\angle 3 = (2x + 40)°$
   $m\angle 7 = (3x + 20)°$
   Find $m\angle 3$.

9. $m\angle 5 = (x^2)°$
   $m\angle 3 = (4x + 21)°$
   Find $m\angle 7$.

10. $m\angle 5 = (4x - 10)°$
    $m\angle 4 = (2x - 20)°$
    Find $m\angle 6$ *and* $m\angle 8$

11. $m\angle 4 = (3x + 40)°$
    $m\angle 7 = (2x)°$
    Find $m\angle 1$.

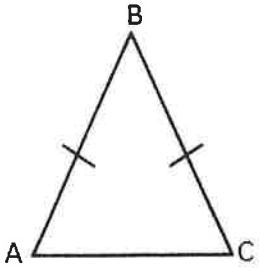
12. $m\angle 3 = (2y)°$
    $m\angle 4 = (x + y)°$
    $m\angle 5 = (2x - y)°$
    Find $m\angle 3$, $m\angle 4$, *and* $m\angle 5$

Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 3 → Triangle Theorems

Name_____
Date_____Pd_____

Triangle Sum Theorem: The sum of the measures of the angles of a triangle is _____.

Remember: An ***ISOSCELES TRIANGLE*** is a 3-sided polygon with at least 2 congruent sides.



Label the vertex angle, the base angles, the legs and the base of the isosceles triangle.

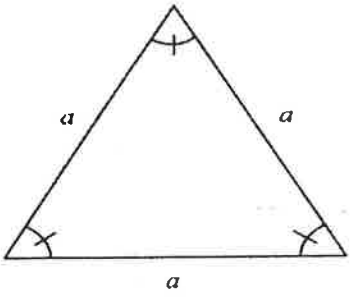
If two **sides** of a triangle are congruent, then the **angles** opposite those sides are congruent:

In ΔABC: if _____ ≅ _____, **then** _____ ≅ _____.

If two **angles** of a triangle are congruent, then the **sides** opposite those angles are congruent:

In ΔABC: if _____ ≅ _____, **then** _____ ≅ _____.

Remember: An ***EQUILATERAL TRIANGLE*** is a 3-sided polygon with all 3 congruent sides.

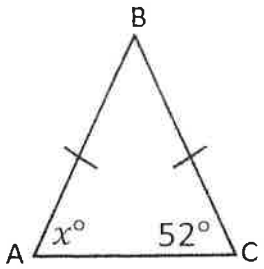


If a triangle is equilateral, then it is _____.

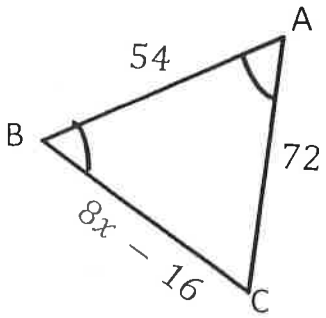
If a triangle is equiangular, then it is _____.

Each angle of an equilateral triangle measures _____.

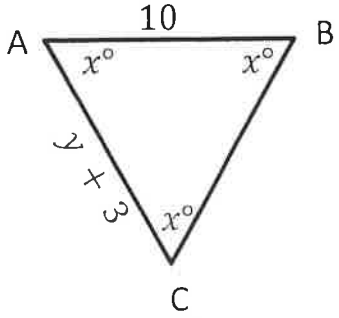
1. Find the value of x:



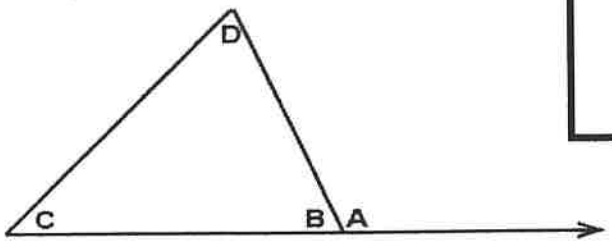
2. Find the value of x:



3. Find the value of x and y:



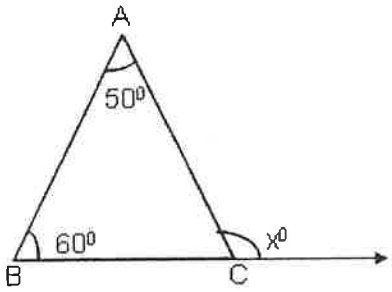
Exterior Angle Theorem: The measure of an exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles.



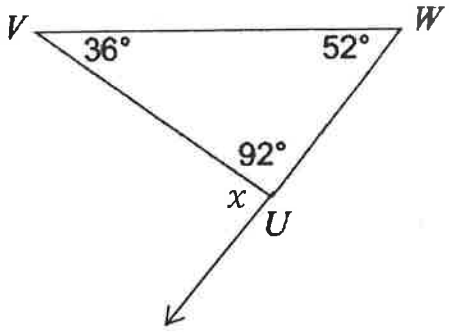
$$m\angle A = m\angle C + m\angle D$$

$$\angle A \ \& \ \angle B \ are \ supplementary$$

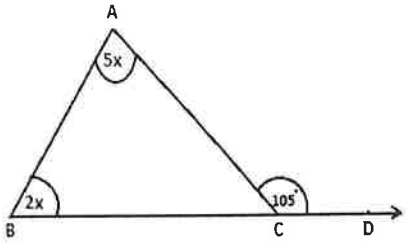
1. Find the measure of x:



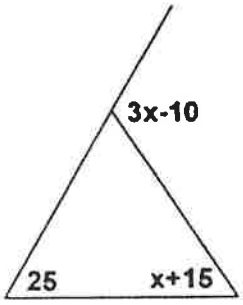
2. Find the measure of x:



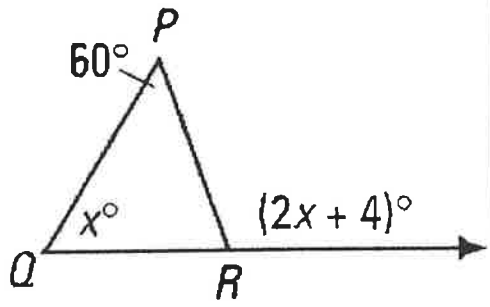
3. Find the value of x:



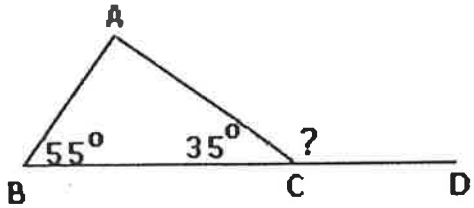
4. Find the value of x:



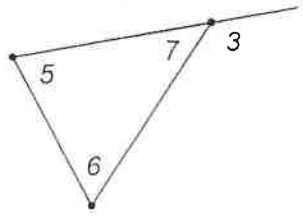
5. Find the value of x:



6. Find the $m\angle ACD$:



7.



$m\angle 5 = 70°, \quad m\angle 6 = 45°,$

$m\angle 7 =$ _____, $m\angle 3 =$ _____

8. Use #7 Figure

$m\angle 3 = 120°, \quad m\angle 6 = 50°,$

$m\angle 5 =$ _____

9. Use #7 Figure

$m\angle 5 = (15x - 70)°,$

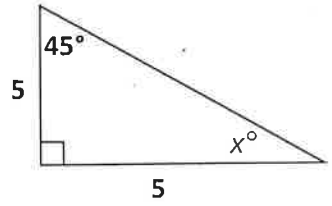
$m\angle 6 = (2x)°, \quad m\angle 3 = (10x)°,$

$x =$ _____

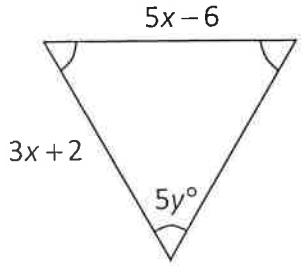
Math 2 – Honors
Unit 5 - Triangles & Similarity
Lesson 3 → Triangle Theorems HOMEWORK

Name_____
Date_____ Pd_____

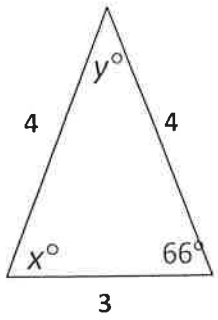
1) Find the value of x:



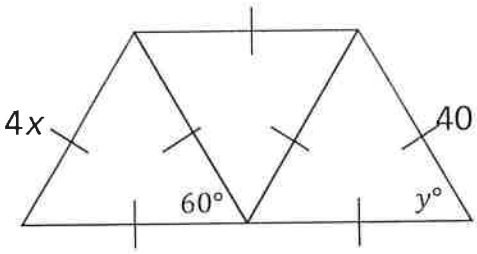
2) Find the values of x *and* y:



3) Find the values of x *and* y:

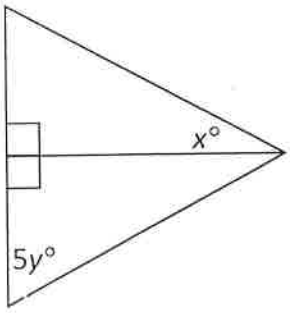


4) Find the values of x *and* y:



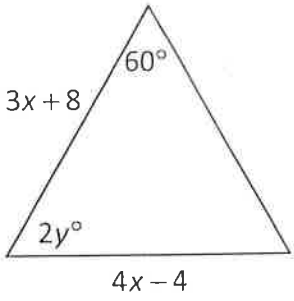
5) Find the values of x *and* y:

Equilateral Triangle

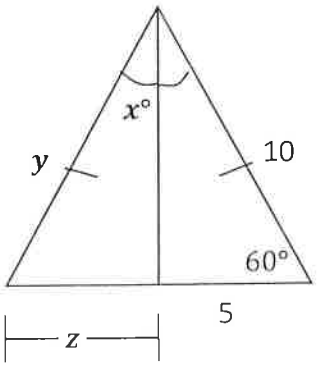


6) Find the values of x *and* y:

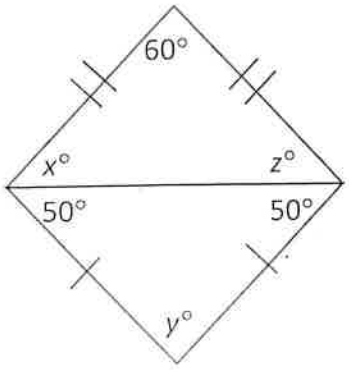
Equilateral Triangle



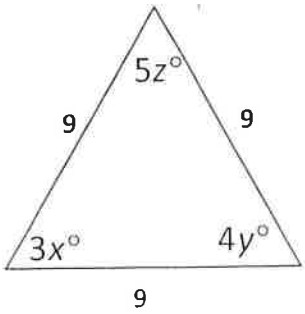
7) Find x, y *and* z:



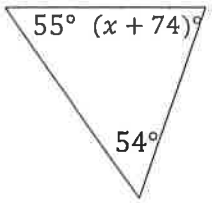
8) Find x, y *and* z:

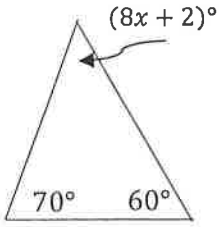


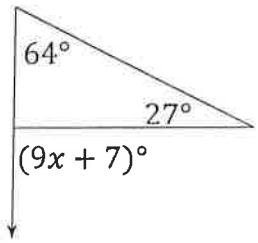
9) Find x, y *and* z:

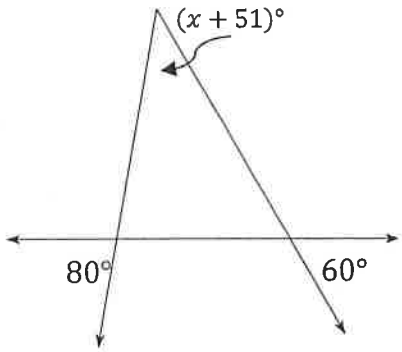


Solve for x:

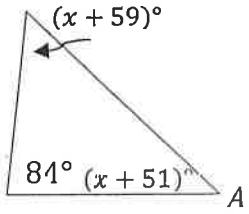
10) 

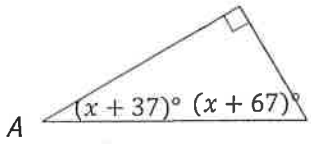
11) 

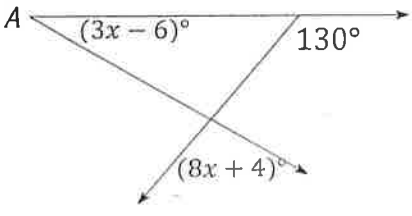
12) 

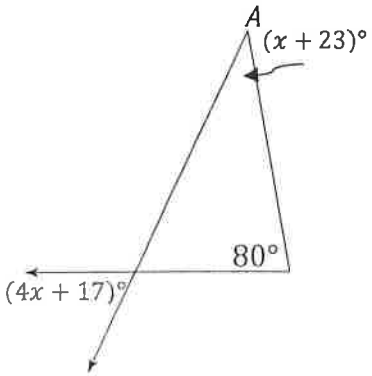
13) 

Solve for x and then find the measure of $\angle A$.

14) 

15) 

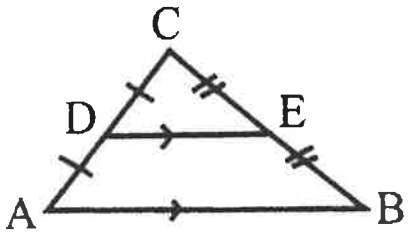
16) 

17) 

Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 4 → Midsegment Theorem

Name_____
Date_____ Pd_____

- The mid-segment of a triangle is the segment joining the **midpoints** of 2 sides of the triangle.
- The mid-segment is **parallel** to the third side and it is **half the length** of the third side.

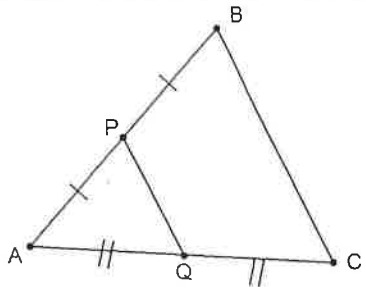


DE is the mid-segment of ΔABC

D is the midpoint of AC and E is the midpoint of BC

DE is parallel to AB and DE = ½ AB or **AB = 2DE**

Examples:



1. If $PQ = 8, BC =$ _____.
2. If $BC = 8, PQ =$ _____.
3. If $AP = 12, PB =$ _____ and $AB =$ _____.
4. If $BC = x + 9$ and $PQ = 5x$, then $x =$ _____, $PQ =$ _____, and $BC =$ _____.
5. If $PQ = x + 12$ and $BC = x^2$, then $x =$ _____, $PQ =$ _____, and $BC =$ _____.

➢ DE is the mid-segment of ΔABC

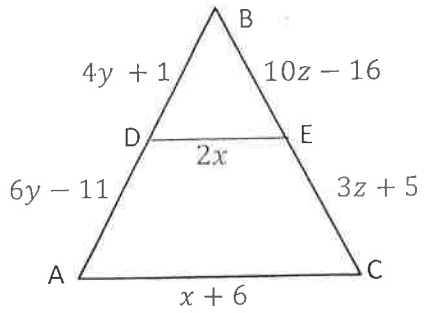
1. Solve for x given that $DE = \frac{5}{2}x + 3$ and $AB = 6x + 4$.

$DE =$ _____ and $AB =$ _____

2. Solve for x given that $DE = \frac{7}{2}x + 2$ and $AB = 3x + 6$.

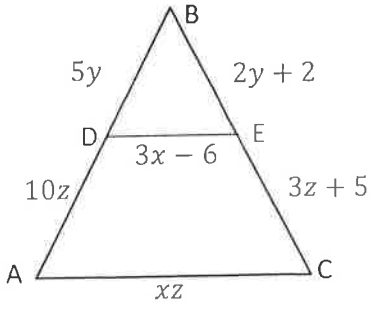
$DE =$ _____ and $AB =$ _____

3.



$x =$ ___ $y =$ ___ $z =$ ___

4.



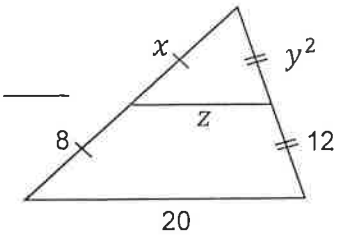
$x =$ ___ $y =$ ___ $z =$ ___

16

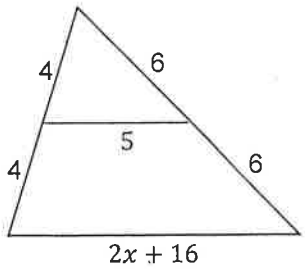
Classwork:

Find the values of the variables. Figures are not drawn to scale.

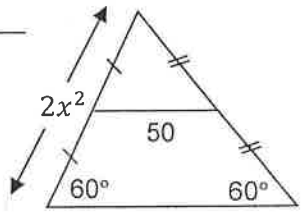
1. $x =$ ____ $y =$ ____ $z =$ ____



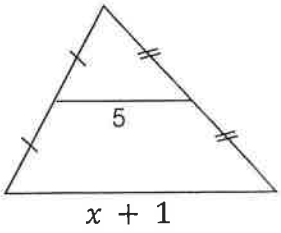
2. $x =$ ____



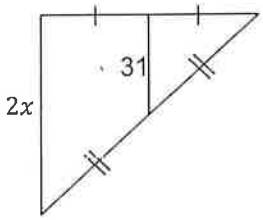
3. $x =$ ____



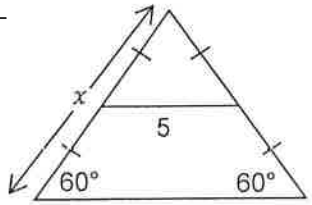
4. $x =$ ____



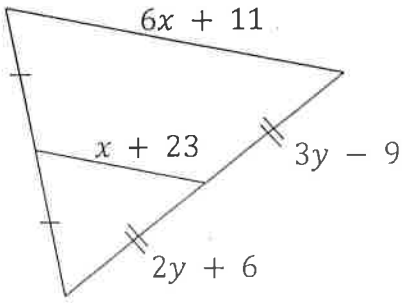
5. $x =$ ____



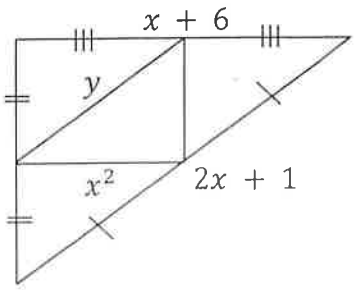
6. $x =$ ____



7. $x =$ ____ $y =$ ____



8. $x =$ ____ $y =$ ____

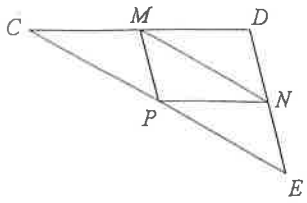


Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 4 → Midsegment Theorem HOMEWORK

Name_____
Date_____Pd_____

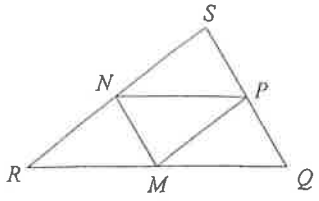
In each triangle, M, N, and P are the midpoints of the sides. Name a segment parallel to the one given.

1)



$\overline{CD} \parallel$ ___

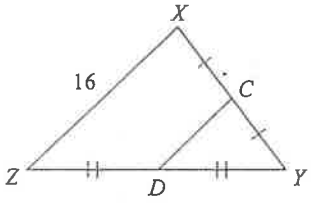
2)



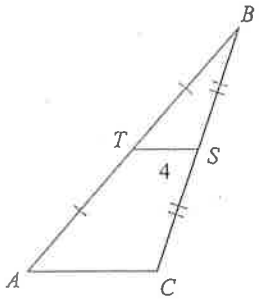
___ $\parallel \overline{QS}$

Find the missing length indicated.

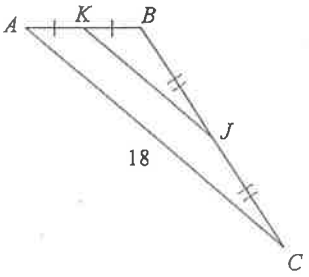
3) Find *CD*



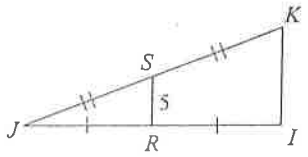
4) Find *AC*



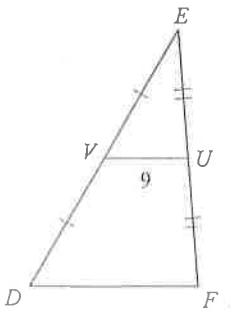
5) Find *KJ*



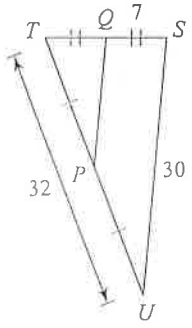
6) Find *IK*



7) Find *DF*

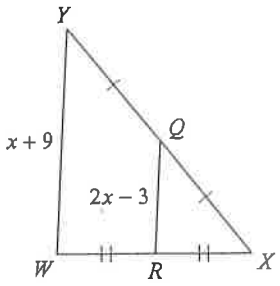


8) Find *PQ*

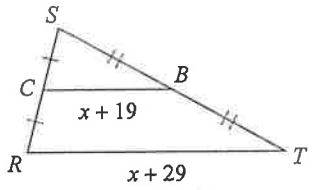


Solve for x.

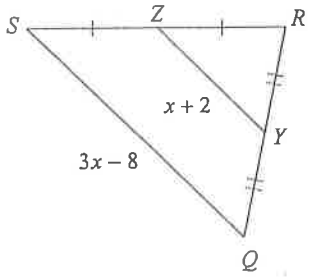
9)



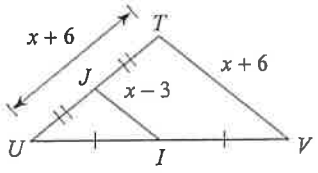
10)



11)

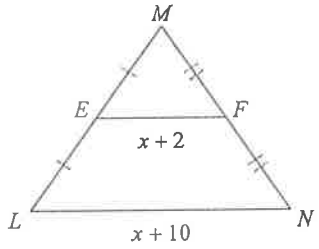


12)

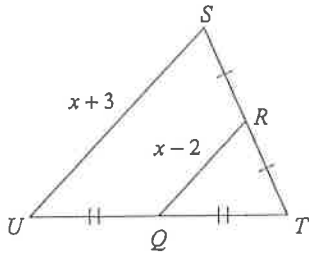


Find the missing length indicated.

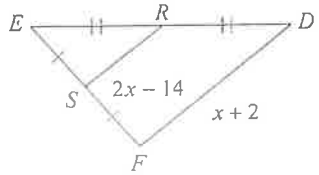
13) Find LN



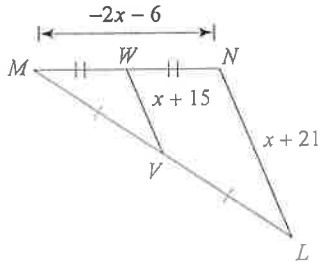
14) Find RQ



15) Find SR



16) Find VW



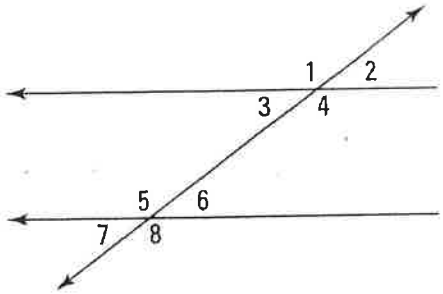
Math 2 – Honors
Unit 5 –Triangles & Similarity
Review for QUIZ

Name_____
Date_____Pd_____

➢ **Fill in the blank correctly.**

1. Supplementary angles always have a sum of _____.
2. Vertical angles are always _____.
3. Complementary angles always have a sum of _____.
4. Linear pairs are always _____.
5. Angles that share a common side without overlapping are _____.
6. Equiangular triangles must also be _____.
7. A triangle whose angles have measures less than 90° is _____.
8. A triangle whose sides have different measures for each is _____.
9. Double the _____ length to find the length of the third side of a triangle.
10. The exterior angle of a triangle is equal to _____.

➢ **For problems 11 – 15 use the figure to the right.**



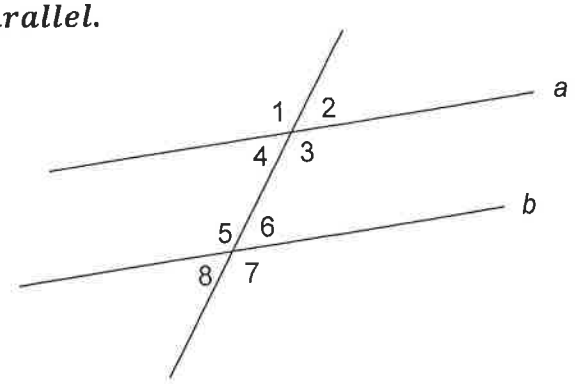
11. Name the alternate interior angle to ∠4. _____
12. Name the alternate exterior angle to ∠7. _____
13. Name the same side interior angle to ∠6. _____
14. Name the vertical angle to ∠2. _____
15. Name three angles that are supplementary to ∠3. _____

➢ **For problems 16 – 24, complete each statement with ALWAYS (A), SOMETIMES (S) or NEVER (N).**

16. An isosceles triangle _____has **exactly** two congruent sides.
17. If two parallel lines are cut by a transversal, corresponding angles are _____ congruent.
18. The vertex angle of an isosceles triangle is _____ located between the base and a leg.
19. An obtuse triangle may _____ be scalene.
20. Equilateral triangles may _____ be obtuse.
21. An obtuse triangle _____ has two obtuse angles.
22. The hypotenuse of a right triangle is _____ the longest side.
23. It is _____ possible for a triangle to be both right and equilateral.
24. An equilateral triangle is _____ equiangular.

20

➢ **For problems 25 - 34, *line a and line b are parallel.***



25. $m\angle 2 = 60°$, $m\angle 6 =$ _____

26. $m\angle 4 = 75°$, $m\angle 6 =$ _____

27. $m\angle 5 = 100°, m\angle 3 =$ _____

28. $m\angle 8 = 50°$, $m\angle 7 =$ _____

29. $m\angle 4 = 50°$, $m\angle 3 =$ _____

30. $m\angle 3 = 60°$, $m\angle 6 =$ _____

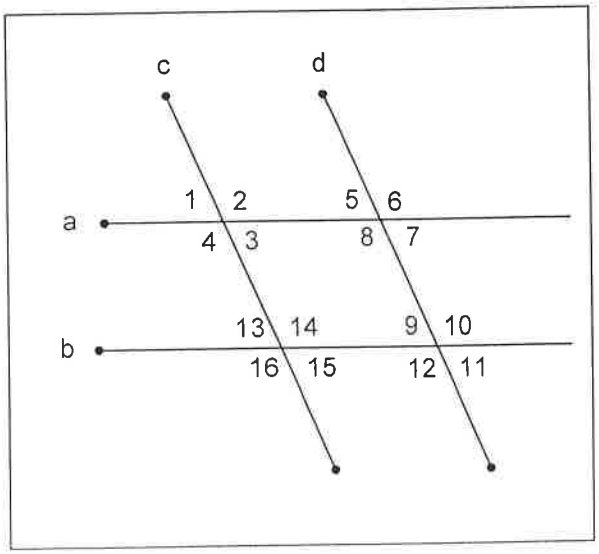
31. $m\angle 1 = 125°$, $m\angle 7 =$ _____

32. $m\angle 2 = 72°$, $m\angle 5 =$ _____

33. $m\angle 3 = 2x + 10$, $m\angle 8 = 5x - 40$, $x =$ _____

34. $m\angle 2 = 2x + 10$, $m\angle 8 = 3x - 35, x =$ _____

➢ **For problems 35 – 45, answer True or False if $a \parallel b$ *and* $c \parallel d$.**



35. Corresponding ∠s are ≅.

36. ∠4 and ∠13 are corr. ∠s.

37. ∠3 ≅ ∠7

38. ∠1 ≅ ∠15

39. ∠6 ≅ ∠7

40. ∠15 and ∠16 supp.

41. ∠4 ≅ ∠9

42. ∠4 ≅ ∠14

43. ∠14 ≅ ∠12

44. ∠1 and ∠11 are vertical angles.

45. ∠11 ≅ ∠13

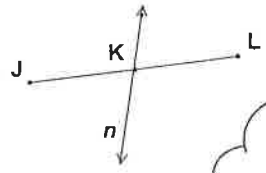
Math 2 – Honors
Unit 5 –Triangles & Similarity
After Quiz Practice

Name_____
Date_____ **Pd**_____

Complete each proof by linking the responses together:

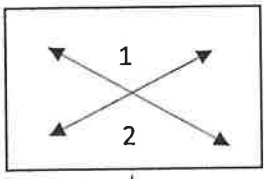
1.

Line ***n*** bisects $\overline{JL}$



$\overline{JK} \cong \overline{KL}$

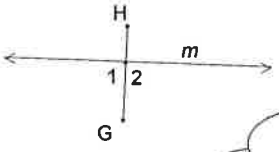
2.



$\angle 2 \cong \angle 3$

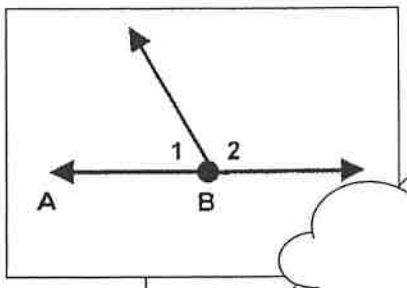
3.

$\overline{GH} \perp m$



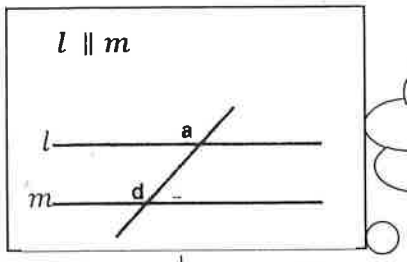
$\angle 1 \cong \angle 2$

4.



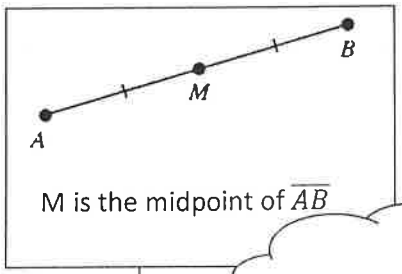
$m\angle 1 + m\angle 2 = 180°$

5.



$\angle d \cong \angle g$

6.



M is the midpoint of $\overline{AB}$

$AM = MB$

Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 5 → Triangle Proportionality Theorem

Name_____
Date_____ Pd_____

Triangle Proportionality Theorem: A line that is parallel to one side of a triangle divides the other two sides proportionally.

- If one triangle is a dilation of a second triangle, the two triangles are **similar** triangles (same shape but different sizes.)
- If two triangles are similar, then the **corresponding angles** of the two triangles are ***congruent*** and **corresponding sides** are ***proportional***.

Proportional Parts and Triangles

Complete each proportion.

1. $\frac{AD}{AC} = \frac{AE}{\quad}$

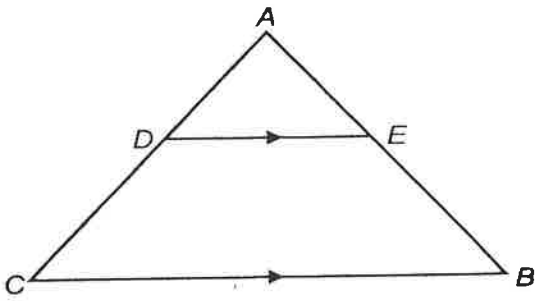
2. $\frac{AD}{DC} = \frac{AE}{\quad}$

3. $\frac{DE}{CB} = \frac{AD}{\quad}$

4. $\frac{\quad}{DE} = \frac{AB}{AE}$

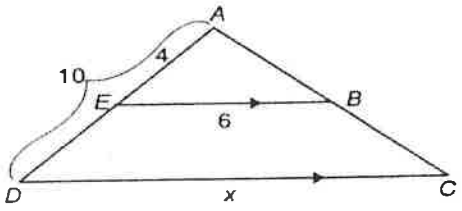
5. $\frac{AC}{\quad} = \frac{AB}{AE}$

6. $\frac{DE}{CB} = \frac{\quad}{AB}$

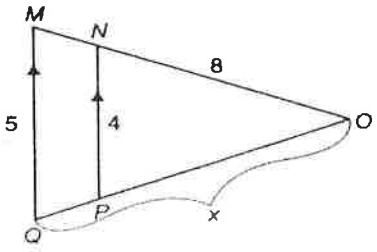


Find the value for each variable.

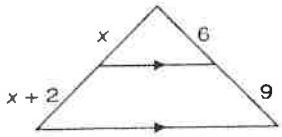
7.



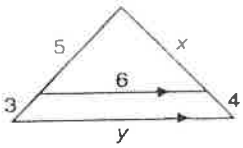
8.



9.



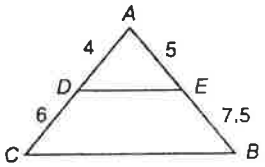
10.



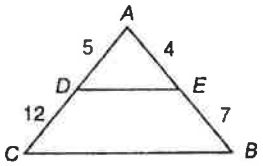
Triangles and Parallel Lines

In each figure, determine whether $\overline{DE} \parallel \overline{CB}$.

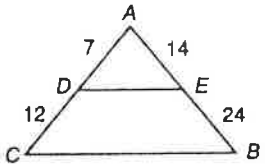
1.



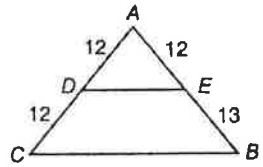
2.



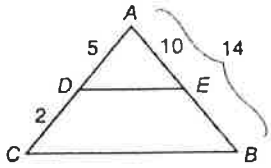
3.



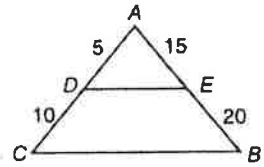
4.



5.

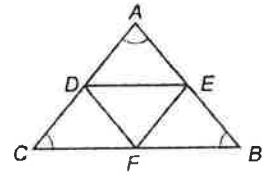


6.



D, E, and F are the midpoints of the sides of $\triangle ABC$. Complete each statement.

7. $\overline{AB} \parallel$ __?__



8. If $AC = 22$, then $EF =$ __?__

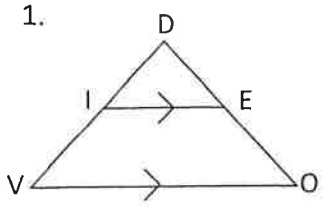
9. If $AE = 6$, find the perimeter of $\triangle DEF$.

10. If $CF = 9$, find the perimeter of $\triangle ABC$.

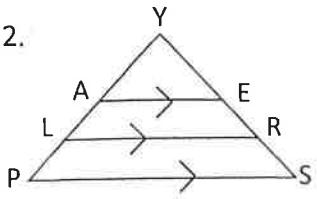
Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 5 → Triangle Proportionality Theorem HOMEWORK

Name_____
Date_____ Pd_____

➢ Fill in the missing part of each proportion.

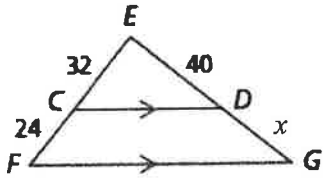
1. 

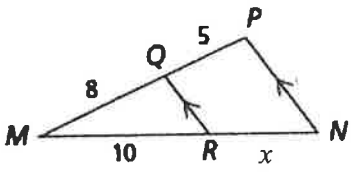
$\frac{ID}{IV} = \frac{DE}{\quad}$ $\quad \frac{ID}{DV} = \frac{DE}{\quad}$

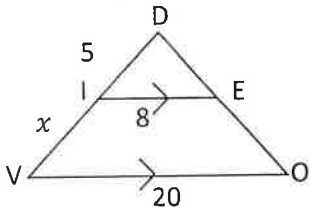
2. 

$\frac{AY}{LA} = \frac{YE}{\quad}$ $\quad \frac{LY}{PL} = \frac{}{RS}$ $\quad \frac{AY}{YR} = \frac{AE}{\quad}$ $\quad \frac{PA}{ES} = \frac{AY}{\quad}$

➢ Now that you can write the proportions, you can solve the problems.

3. 

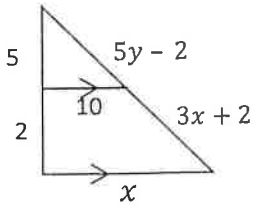
4. 

5. 

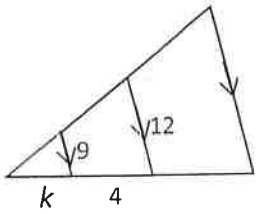
➢ Solve for the variable in each figure:

6. $y =$_____

$x =$_____

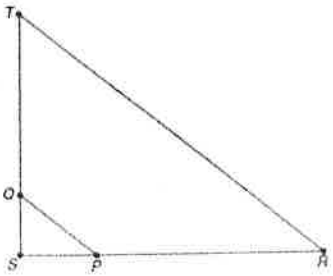


7. $k =$_____



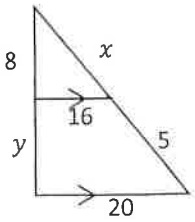
8. SQ = x ; ST = 22 ;
SP = 12 ; PR = $4x + 8$

$x =$_____

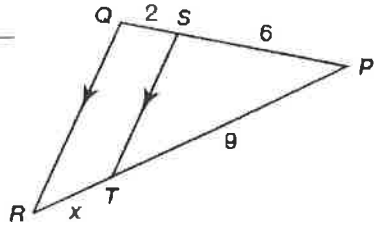


9. $y =$_____

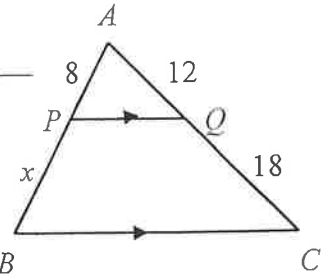
$x =$_____



10. $x =$_____



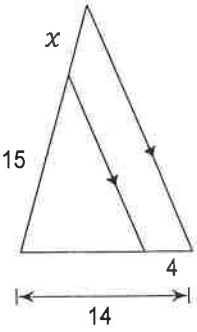
11. $x =$_____



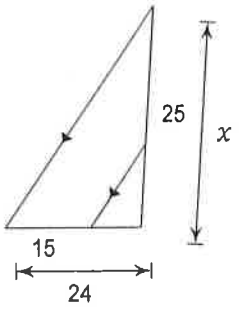
26

➢ Solve for x.

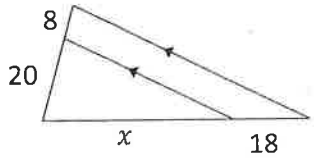
12)



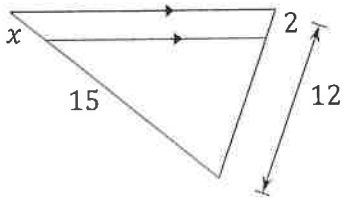
13)



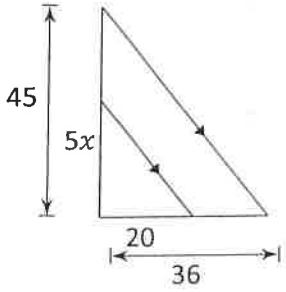
14)



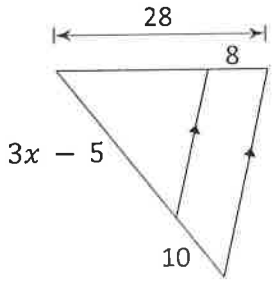
15)



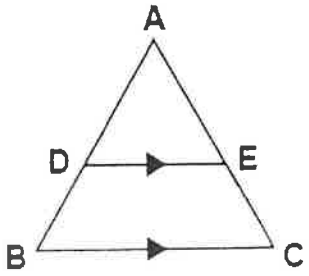
16)



17)



18) Find x so that $\overline{DE} \parallel \overline{BC}$



A) $BD = 3,\ CE = 5,\ DA = 9,\ EA = x + 3$

B) $CE = 3,\ DA = 3x + 1,\ BD = 4,\ EA = x + 7$

C) $EA = 5x - 6,\ CE = 3,\ DA = 5x + 1,\ BD = 5$

Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 6 → Similar Triangles

Name_____
Date_____Pd_____

Identifying Similar Triangles: Triangles are similar if they have the same SHAPE, but different sizes.

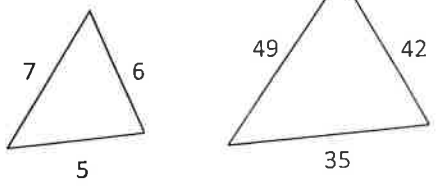
	The measures of the corresponding **side lengths** of two triangles are **proportional.**
	Two angles of one triangle are **congruent** to two **angles** of another triangle.
	The measures of **two side lengths** of one triangle are **proportional** to the measures of two corresponding side lengths of another triangle, and the included **angles** are **congruent**.

"How do you know if two triangles are similar?"

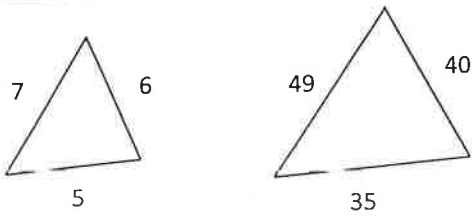
Answer number 1: "The problem told me they were similar."

Example:

Answer number 2: "All three corresponding pairs of sides are _____."

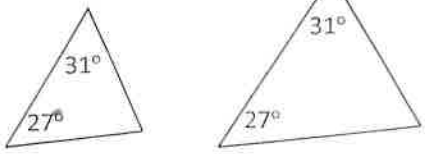


These two triangles are similar because the sides are _____.

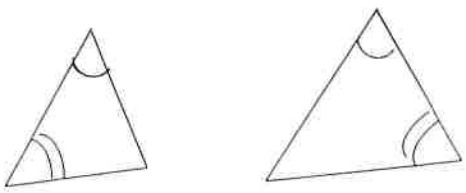


These two triangles are **NOT** similar because the sides are _____.

Answer number 3: "Two corresponding pairs of angles are _____."

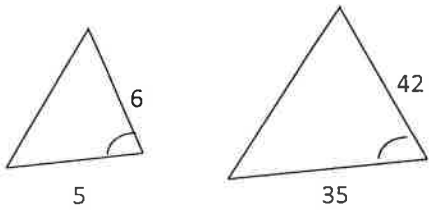


These two triangles are similar because corresponding angles are _____.

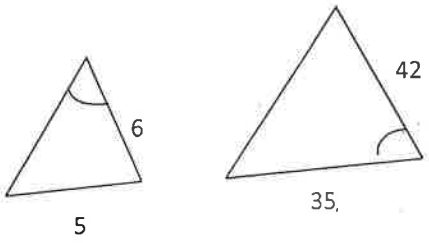


These two triangles are **NOT** similar because congruent angles are not _____.

Answer number 4: "Two corresponding pairs of sides are _____, and the _____ angles are _____."



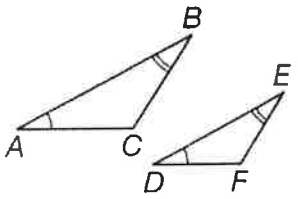
These two triangles are similar because Corresponding sides are _____ and included angles are _____.



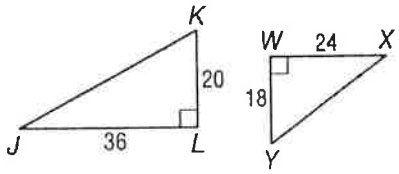
These two triangles are **NOT** similar because the congruent angle is not _____ in the first triangle.

Determine whether the triangles are similar. If so, state the reason and then write a similarity statement.

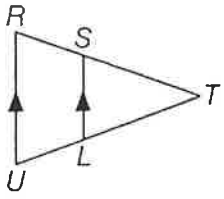
1.



2.



3.



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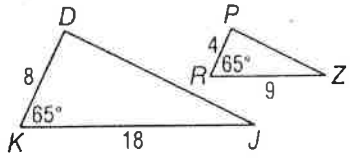

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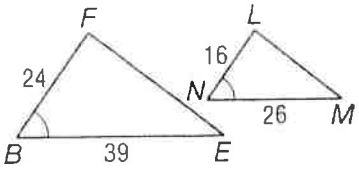

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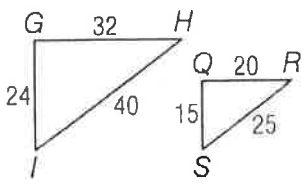
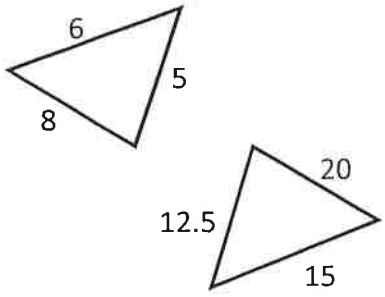


Determine whether the two triangles are similar. If so, state the reason (SSS ~, SAS~, AA~)

1.



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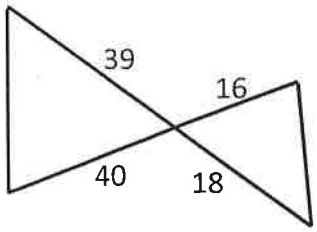
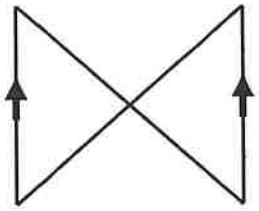


3.



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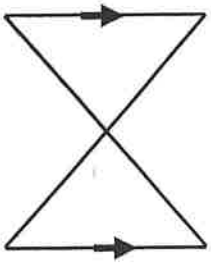

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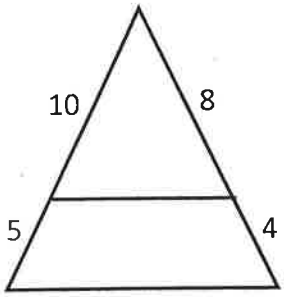

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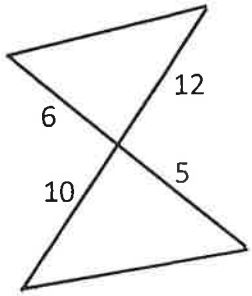

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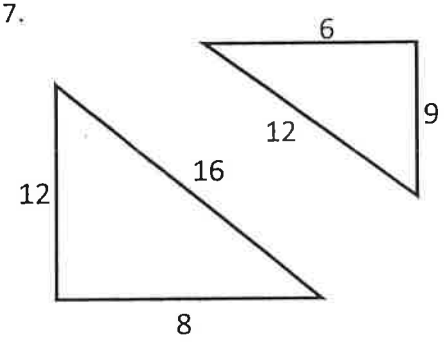

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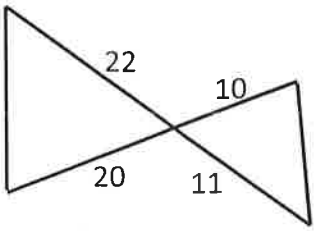

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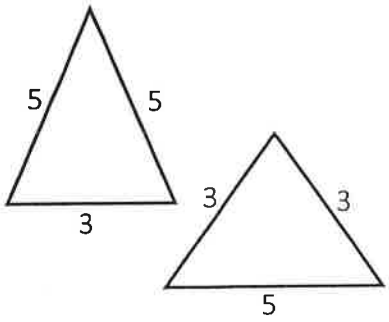

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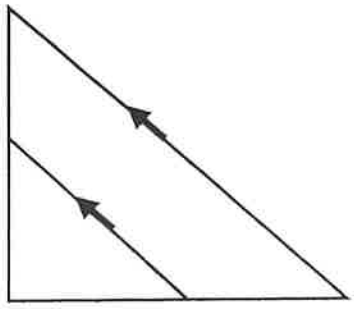

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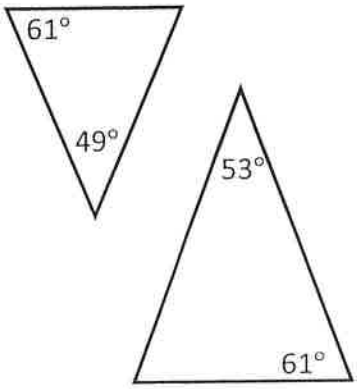

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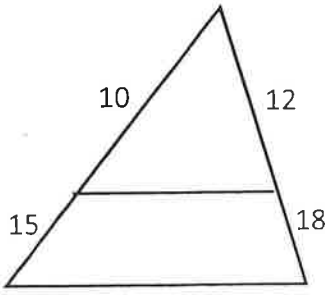
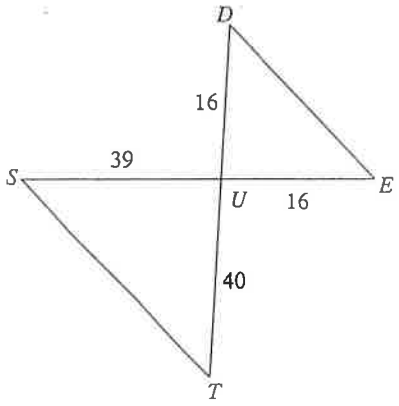


Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 6 → Similar Triangles HOMEWORK

Name_____
Date_____Pd_____

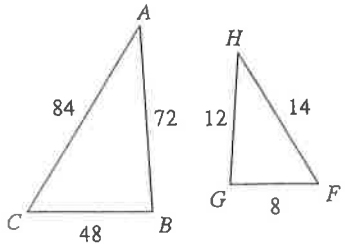
State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

1)



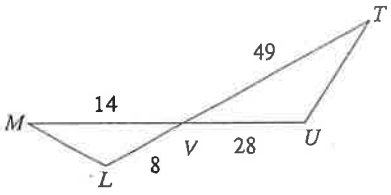
$\Delta UTS \sim$ _____

2)



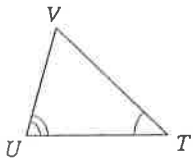
$\Delta CBA \sim$ _____

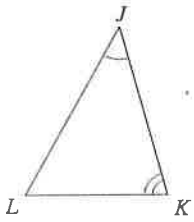
3)



$\Delta VUT \sim$ _____

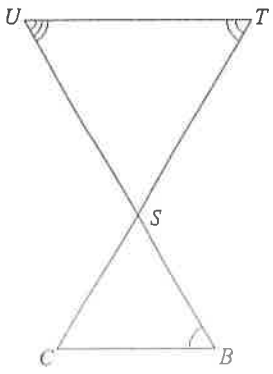
4)





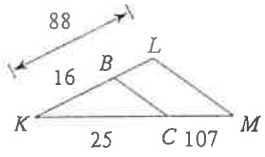
$\Delta JKL \sim$ _____

5)



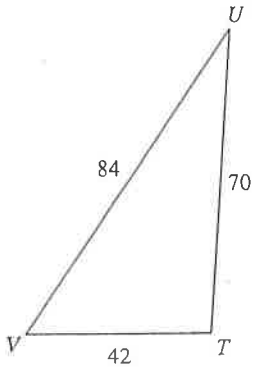
$\Delta STU \sim$ _____

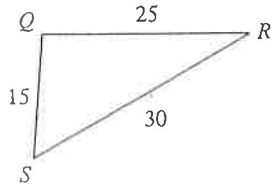
6)



$\Delta KLM \sim$ _____

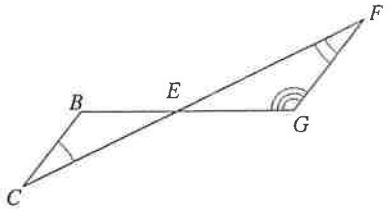
7)





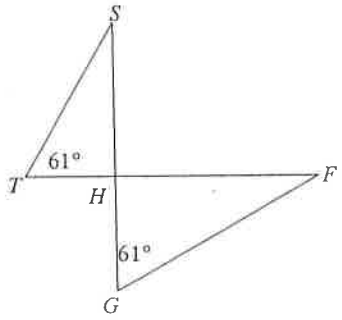
$\Delta TUV \sim$ _____

8)



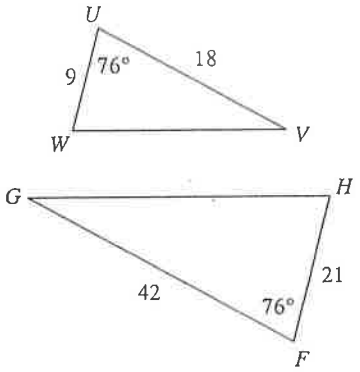
$\Delta EFG \sim$ _____

9)



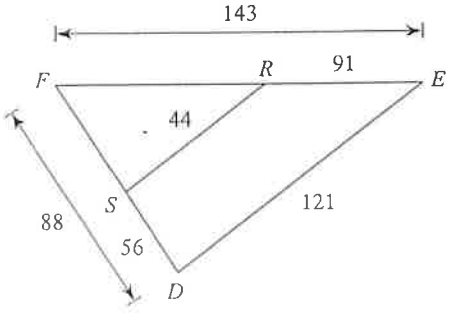
$\Delta HGF \sim$ _____

10)



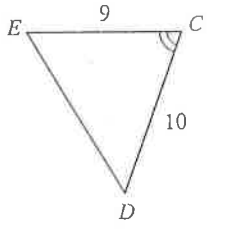
$\Delta FGH \sim$ _____

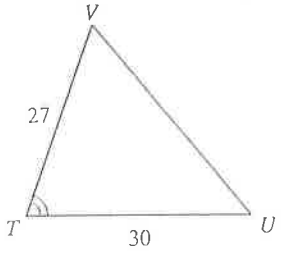
11)



$\Delta FED \sim$ _____

12)

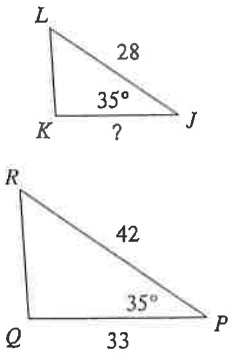




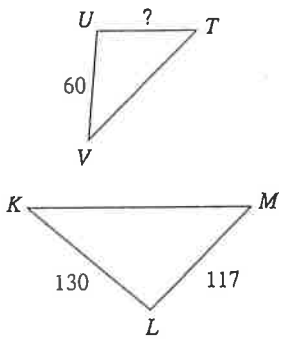
$\Delta TUV \sim$ _____

Find the missing length. The triangles in each pair are similar.

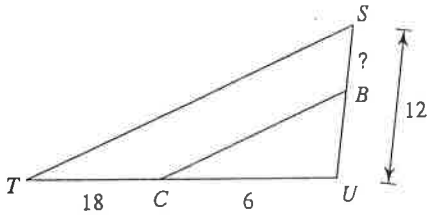
13)



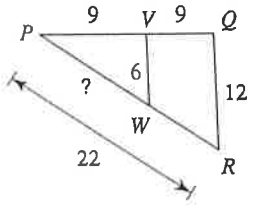
14)



15)

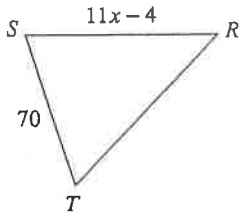


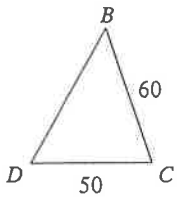
16)



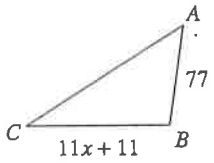
Solve for x. The triangles in each pair are similar.

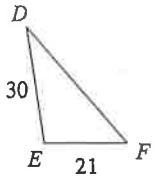
17)



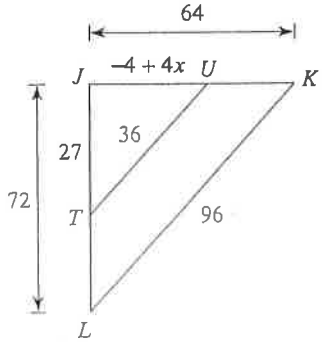


18)

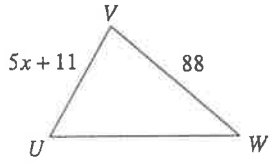


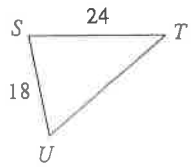


19)



20)



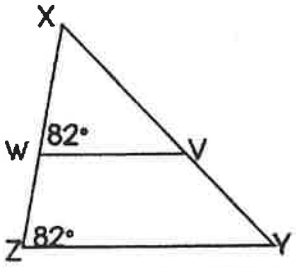


Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 7 → Proving Triangles are Similar

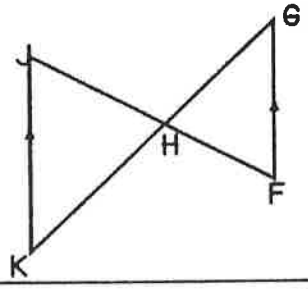
Name_____
Date_____Pd_____

➢ Review of Similarity: $AA\sim$ $SAS\sim$ $SSS\sim$

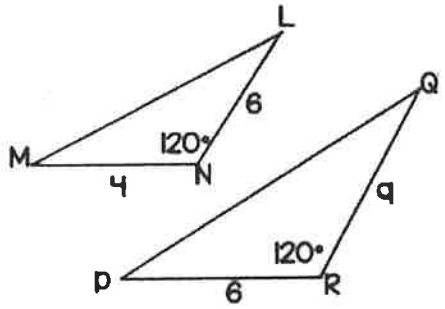
EX 1: Are the two triangles similar? If so, state how and write a similarity statement.



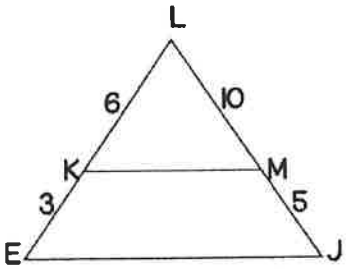
EX 2: Are the two triangles similar? If so, state how and write a similarity statement.



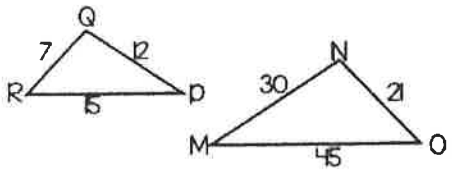
EX 3: Are the two triangles similar? If so, state how and write a similarity statement.



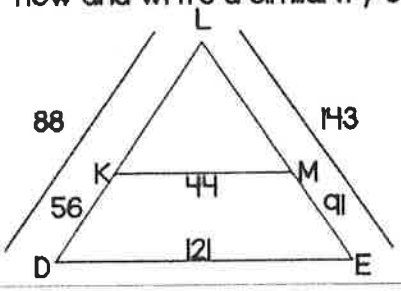
EX 4: Are the two triangles similar? If so, state how and write a similarity statement.



EX 5: Are the two triangles similar? If so, state how and write a similarity statement.



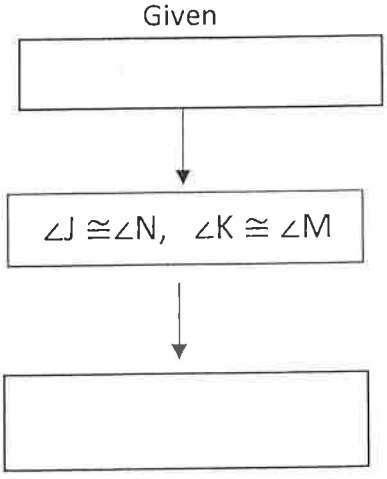
EX 6: Are the two triangles similar? If so, state how and write a similarity statement.

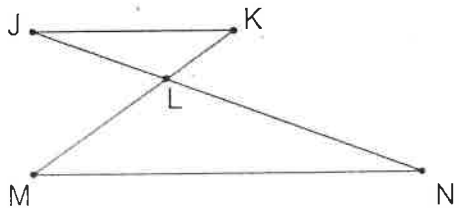


➢ Now that we know how to **recognize** that two triangle are similar, we can use this knowledge to **prove** two triangles are similar.

EX#1: Given: $\overline{JK}//\overline{MN}$

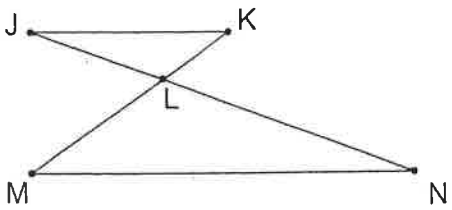
Prove: ΔJKL ~ ΔNML





EX#2: Given: $\frac{JL}{LN} = \frac{KL}{LM}$

Prove: ΔJKL ~ ΔNML

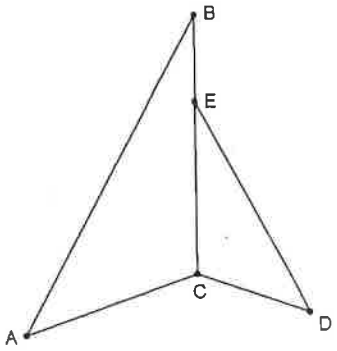


Given

Vertical ∡s are ≅

EX#3: Given: $\frac{AB}{DE} = \frac{AC}{DC} = \frac{BC}{EC}$

Prove: ∠A ≅ ∠D

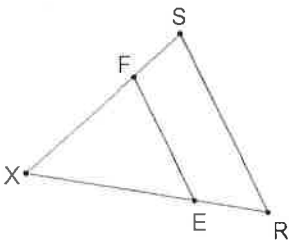


Given

Corresponding angles of similar triangles are congruent.

EX#4: Given: $\frac{XF}{XS} = \frac{XE}{XR}$

Prove: ∠XFE ≅ ∠S



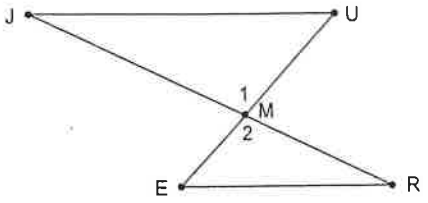
Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 7 → Proving Triangles are Similar HOMEWORK

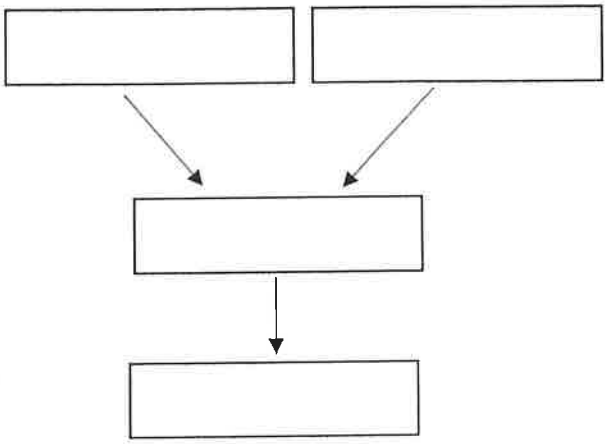
Name_____
Date_____ Pd_____

Create a Similarity Proof for each:

1. Given: $\angle J \cong \angle R$

   Prove: $\frac{JU}{RE} = \frac{MU}{ME}$





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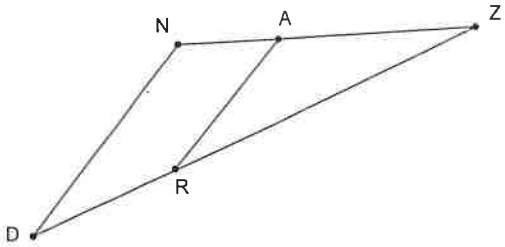
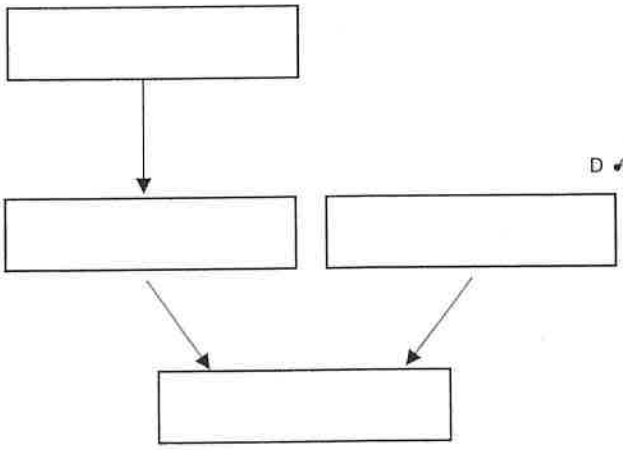
2. Given: $\overline{ND} \parallel \overline{AR}$

   Prove: $\Delta NDZ \sim \Delta ARZ$





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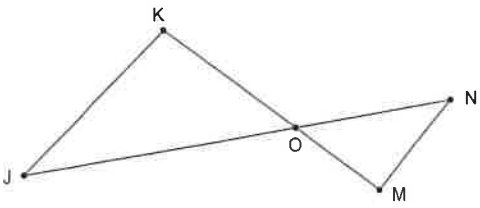
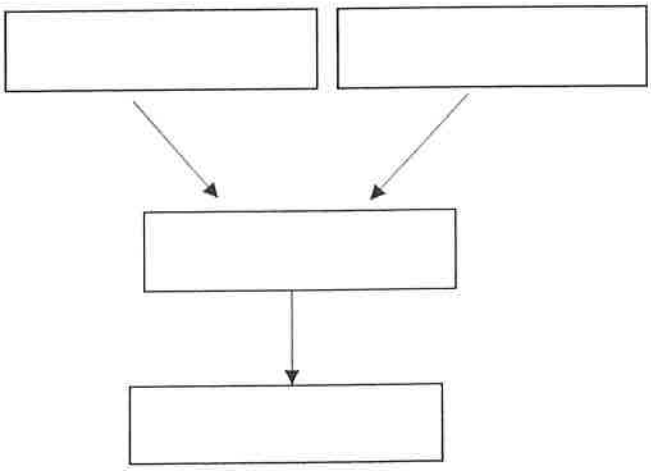
3. Given: $\frac{JO}{NO} = \frac{KO}{MO}$

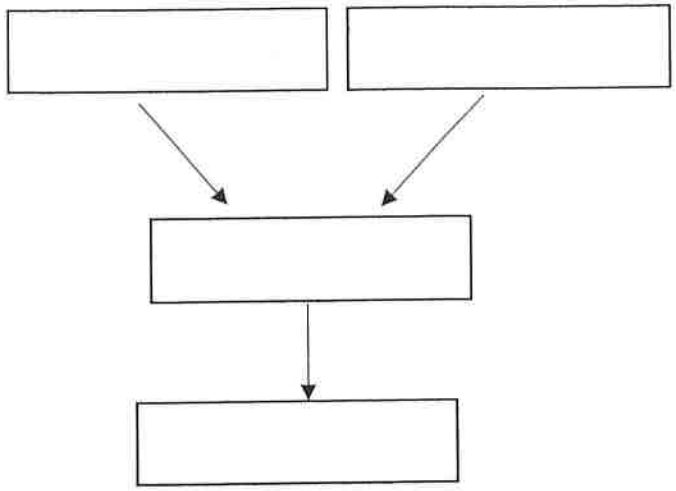
   Prove: $\angle J \cong \angle N$

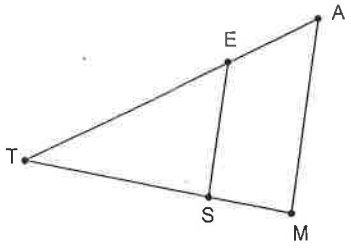




4. Given: $\frac{TE}{TA} = \frac{TS}{TM}$

Prove: $\frac{TE}{TA} = \frac{SE}{MA}$





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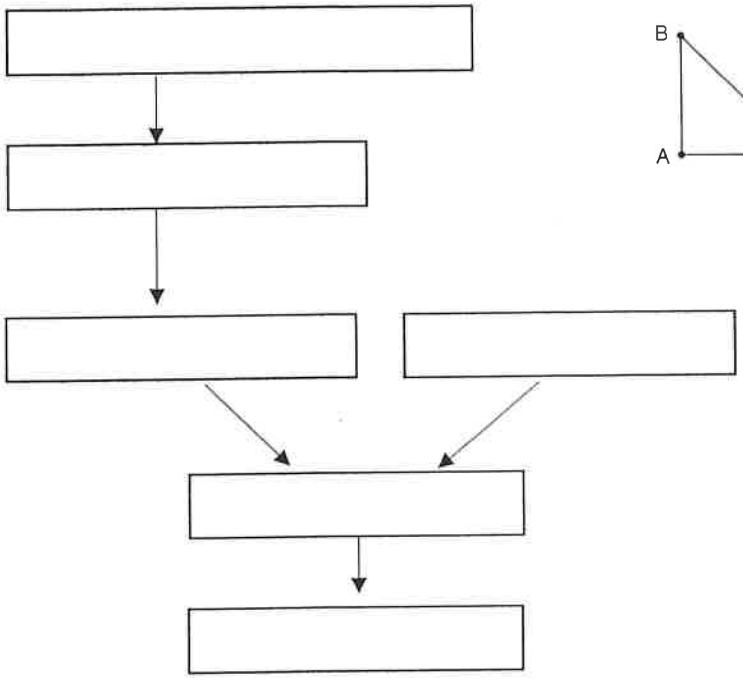
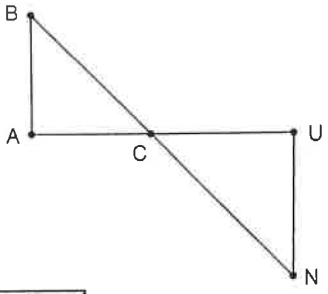
5. Given: $\overline{AB} \perp \overline{AC}$
$\overline{NU} \perp \overline{UC}$

Prove: $\frac{AC}{UC} = \frac{CB}{CN}$





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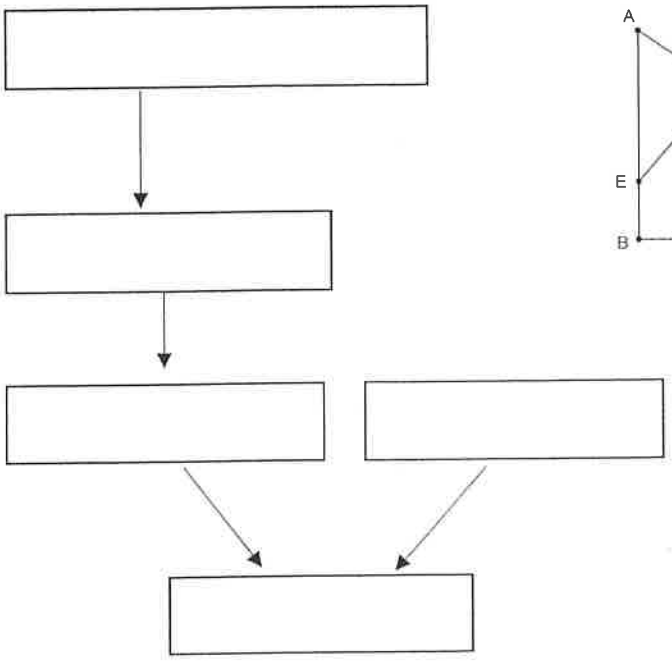
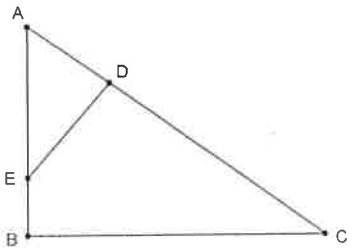
6. Given: $\overline{ED} \perp \overline{AC}$
∠B is a right angle

Prove: $\Delta ADE \sim \Delta ABC$





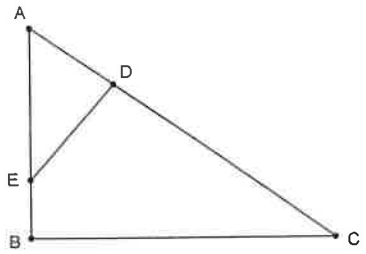
Math 2 – Honors
Unit 5 –Triangles & Similarity
Lesson 7 continued → Proving Triangles are Similar

Name_____
Date_____Pd_____

TWO COLUMN PROOFS:

Given: $\overline{ED} \perp \overline{AC}$
$\angle B$ is a right angle

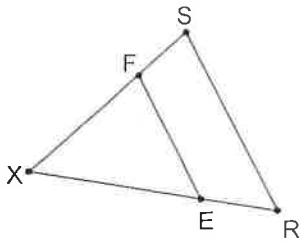
Prove: $\Delta ADE \sim \Delta ABC$



Statements	Reasons

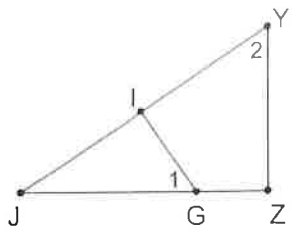
Write a two column similarity proof for each:

1. Given: $\overline{EF} \parallel \overline{RS}$
Prove: $\frac{FX}{SX} = \frac{EF}{RS}$



Statements	Reasons

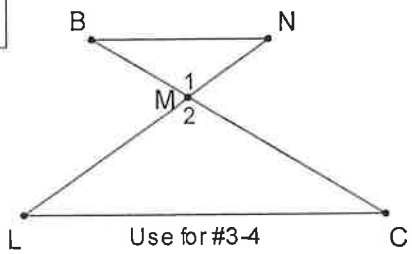
2. Given: $\angle 1 \cong \angle 2$
Prove: $\frac{JG}{JY} = \frac{GI}{YZ}$



Statements	Reasons

3. Given: $\angle B \cong \angle C$
   Prove: $\Delta BNM \sim \Delta CLM$

Statements	Reasons

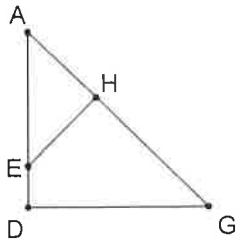


Use for #3-4

4. Given: $\overline{BN} \parallel \overline{LC}$
   Prove: $\frac{BM}{CM} = \frac{NM}{LM}$

Statements	Reasons

5. Given: $\angle D$ and $\angle AHE$ are right angles
   Prove: $\angle G \cong \angle AEH$

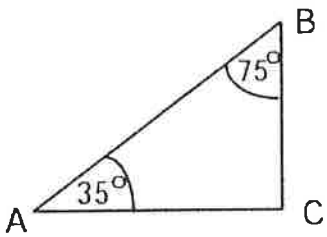


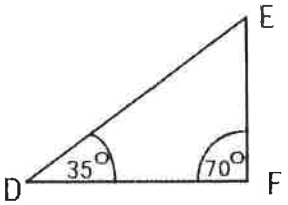
Statements	Reasons

Math 2 – Honors
Unit 5 –Triangles & Similarity
Quiz #2 Review

Name_____
Date_____ Pd_____

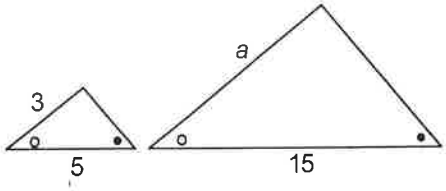
1. State whether or not the following triangles are similar and support your answer.



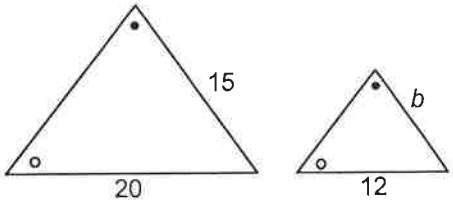


2. (i) Determine if the triangles below are similar, and explain how you know.
   (ii) Find the lengths of the missing sides.

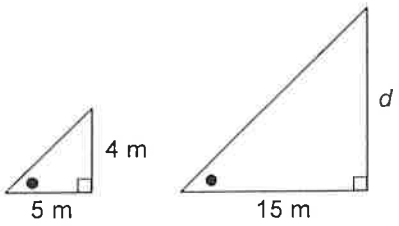
a)



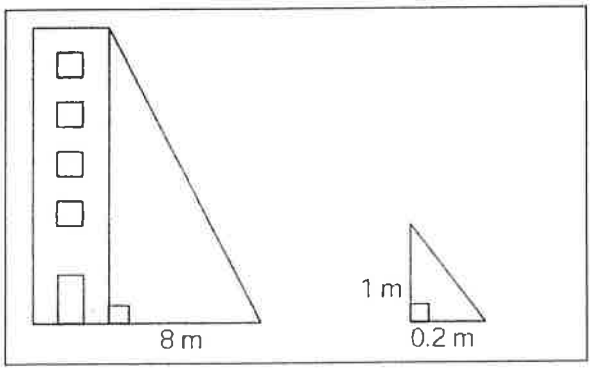
b)



c)



3. Assuming the two triangles are similar, find the tower's height from the given measurements below.

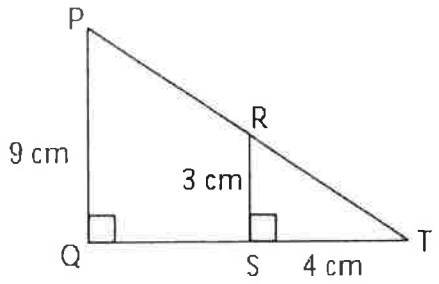


4. Looking at the triangles in the figure below:

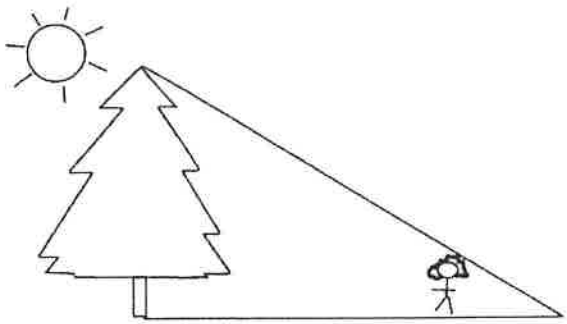
   Are the two triangles similar?

   What is the length of *QT*?

   If *PT* is 15 cm, what is the length of *RT*?

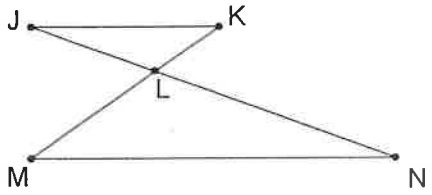


5. Tonya is 1.3 meters tall. She stands 7 meters in front of a tree and casts a shadow 1.8 meters long. How tall is the tree?

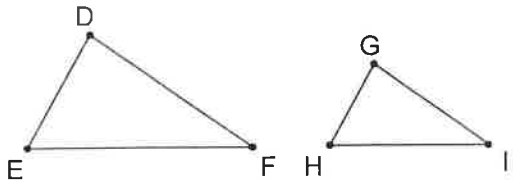


6. Given: $\frac{JL}{NL} = \frac{KL}{ML}$

   Prove: $\angle J \cong \angle N$



Statements	Reasons



Use for #7-8

7. Given: $\frac{DE}{GH} = \frac{DF}{GI} = \frac{EF}{HI}$

   Prove: $\angle E \cong \angle H$

Statements	Reasons

8. Given: $\frac{DE}{GH} = \frac{EF}{HI}$

   $\angle E \cong \angle H$

   Prove: $\frac{EF}{HI} = \frac{DF}{GI}$

Statements	Reasons

Math 2 – Honors
Unit 5 –Triangles & Similarity
After Quiz Practice with Triangles

Name_____
Date_____ **Pd**_____

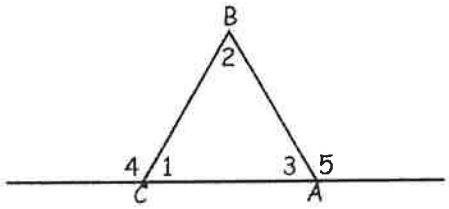
1. In triangle ABC, $m\angle A = x°$, $m\angle B = (x + 10)°$, and $m\angle C = (3x + 20)°$. Find the $m\angle A$.

2. In triangle DEF, $m\angle E = (x + 10)°$, $m\angle D = (3x + 30)°$, and $m\angle F = (5x + 50)°$. Find the $m\angle F$.

3. The measure of each base angle of an isosceles triangle is 20°. Find the measure of the vertex angle.

4. Two angles of a triangle are equal in measure and the third angle is 110°. Find the number of degrees in each of the two equal angles.

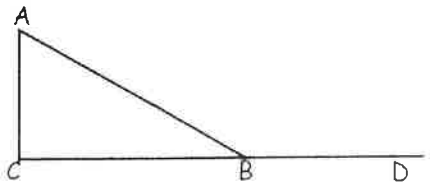
5. Triangle ABC is an equilateral triangle. Fill in the measures of all the numbered angles.



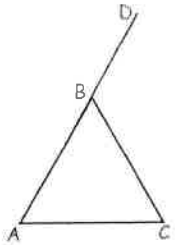
∠1: ∠2: ∠3:

∠4: ∠5:

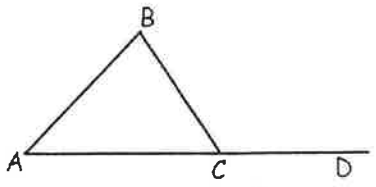
6. Find the measure of $\angle A$, if $\angle C$ is a right angle and $m\angle ABD = 130°$:



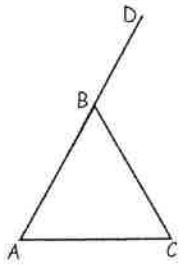
7. In ΔABC, $\overline{AB} \cong \overline{CB}$ and $m\angle CBD = 124°$. Find the $m\angle A$.



8. In ΔABC, $m\angle BCD = 100°$ and $m\angle BAC = 35°$. Find the $m\angle B$.

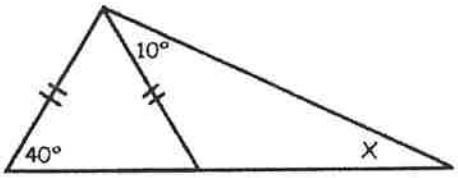


9. In Isosceles ΔABC, $\overline{AB} \cong \overline{AC}$, $m\angle C = (6x + 10)°$ and $m\angle ABC = (3x + 40)°$. Find the measure of the exterior angle $\angle DBC$.

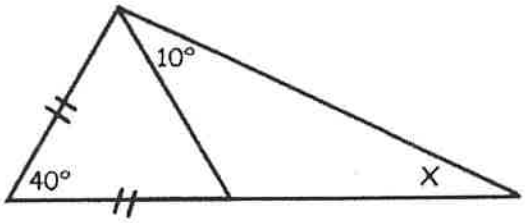


10. Find the value of x:

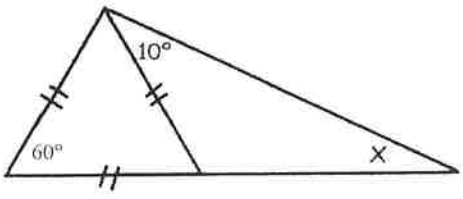
a.



b.



c.



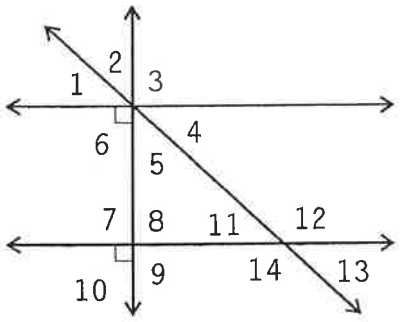
Math 2 - Honors

Unit 5 Test Review

Name _____

Per/Sec. _____ Date _____

Refer to the diagram to answer questions 1-7.



1. $\angle 1$ and $\angle 2$ are _____ angles.

2. $\angle 11$ and $\angle 12$ are _____ angles.

3. $\angle 12$ and $\angle 14$ are _____ angles.

4. $\angle 11$ and $\angle 4$ are _____ angles.

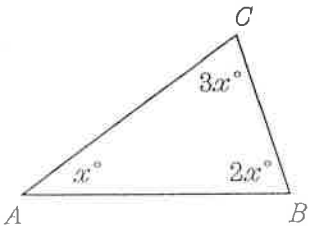
5. $\angle 10$ and $\angle 3$ are _____ angles.

6. $\angle 4$ and $\angle 12$ are _____ angles.

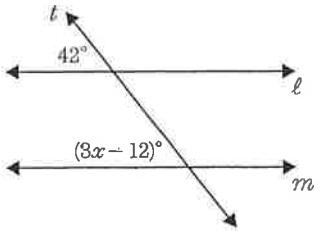
7. $\angle 4$ and $\angle 13$ are _____ angles.

8. Given that $m\angle 1 = 47°$, find the measure of the other angles.

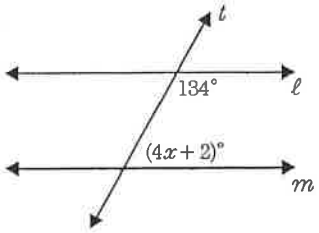
9. Find the measure of $\angle ABC$.



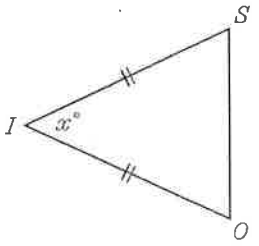
10. Find x so that $\ell \parallel m$.



11. Find x so that $\ell \parallel m$.



12. In the diagram, $\triangle ISO$ is isosceles. If $x = 52$ and $IO = 6$, find the values for the following:



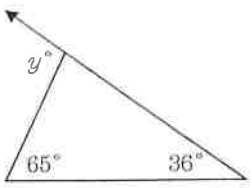
a) $m\angle S =$ _____

b) $IS =$ _____

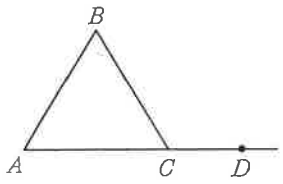
c) $m\angle SOI =$ _____

13. In equilateral $\triangle ABC$, $AB = \frac{1}{2}x + 5$, and $BC = 2x - 13$. Solve for x and then find the length of each side of the triangle.

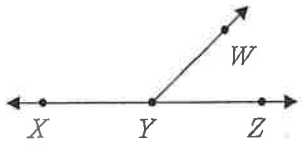
14. Find the value of y in the diagram.



15. In the diagram, $m\angle A = 4x + 11$, $m\angle B = 5x$ and $m\angle BCD = 10x$. What is the measure of $\angle BCA$?



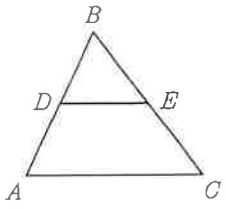
16. In the figure $\angle XYW$ and $\angle WYZ$ form a linear pair, if $m\angle XYW = 135$, then find $m\angle WYZ$.



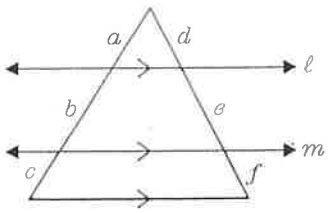
17. If two complementary angles have degree measures of $m\angle X = 8x - 12$ and $m\angle Y = 2x + 2$, what is the value of $m\angle X$?

18. Given that $\angle A$ and $\angle B$ are supplementary, if $m\angle A = (2y)°$ and $m\angle B = (y - 15)°$, find $m\angle B$.

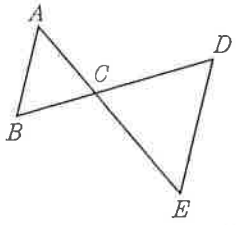
19. In this triangle, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{BC}$. If $DE = 2x - 1$, and $AC = 2x + 3$ SOLVE for x.



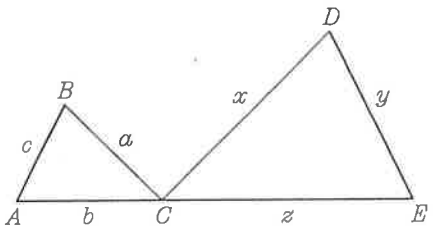
20. In the diagram, lines ℓ and m are parallel to the base of the triangle, $a = 3$, $b = 6$, $c = 2$, and $d = 3\frac{1}{3}$. What are the exact values of e and f?



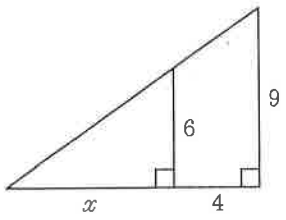
21. In the diagram, $\angle A \cong \angle E$. $\triangle ABC \sim$ ____ by ____.



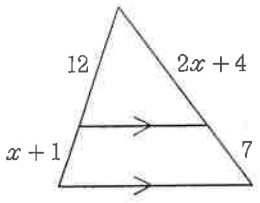
22. In the diagram, it is known that $\frac{b}{z} = \frac{c}{y} = \frac{a}{x}$. $\triangle ABC \sim \triangle$____ by ____.



23. Find the value of x if the two triangles are similar.



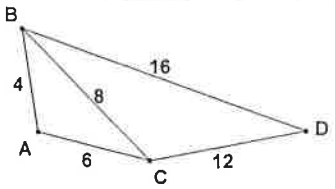
24. Find the value of x if the two triangles are similar.



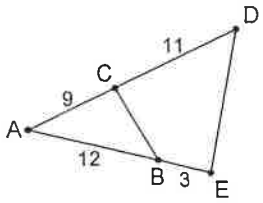
25. In the diagram, $\triangle ABC \sim \triangle EFG$, $AB = 12$, $EF = 30$, $BC = x$, and $FG = 2x + 11$. What is the value of x?

➢ If the triangles in 26-30 can be proved similar, (1) Complete the similarity statement and (2) Tell which theorem or postulate you would use. If they cannot be proved similar then write "None."

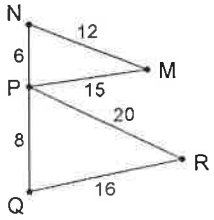
26. $\Delta ABC \sim \Delta$_____ by _____



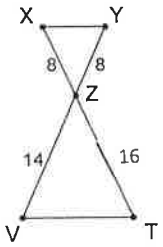
27. $\Delta ABC \sim \Delta$_____ by _____



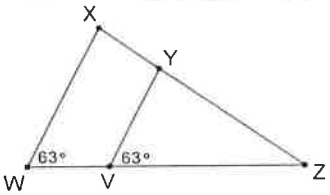
28. $\Delta NMP \sim \Delta$_____ by _____



29. $\Delta XYZ \sim \Delta$_____ by _____



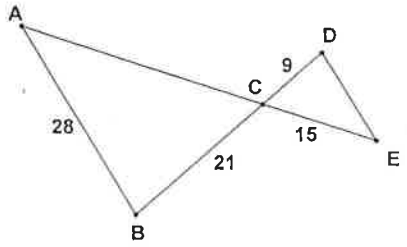
30. $\Delta YVZ \sim \Delta$_____ by _____



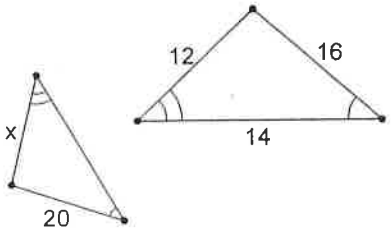
31. $\Delta BAC \sim \Delta DEC$

a. Find AC. _____

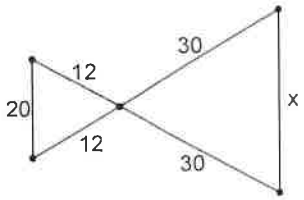
b. Find DE. _____

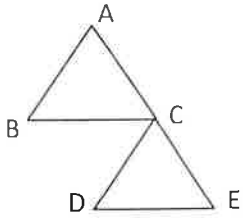


32. $x =$ _____



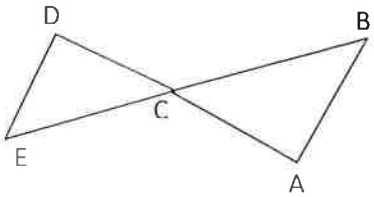
33. $x =$ _____





34. Given: $\overline{DA} \perp \overline{DE}$; $\overline{DA} \perp \overline{BA}$

Prove: $\Delta EDC \sim \Delta BAC$



35. Given: $\overline{BC} \parallel \overline{DE}$; $\frac{AC}{CE} = \frac{BC}{DE}$

Prove: $\angle B \cong \angle D$

Statement	Reason
1.	1. GIVEN
2.	2.
3.	3.
4.	4.
5. $\Delta EDC \sim \Delta BAC$	

Statement	Reason
1.	1. GIVEN
2.	2.
3.	3.
4. $\angle B \cong \angle D$	