Geometry **Name: ________________**

Unit 2 Agenda - Similar Figures PACKET #2

DATE	DAY	LESSON	PAGES	HOMEWORK
FRI 8/19	2.1	Prerequisite Skills		
MON 8/22		**HALF DAY -** Practice Activity		
TUES 8/23	2.2	Parallel Lines Cut by a Transversal Intro		DeltaMath 2.1 Due 9/1
WED 8/24	2.3	Parallel Lines Cut by a Transversal, Day 2 Activity		
THURS 8/25	---	**MATH INVENTORY**		
FRI 8/26	2.4	Ticket to the Party GLOW-IN-THE-DARK TRANSVERSAL PARTY!		
MON 8/29	2.5	Intro to Similarity		
TUES 8/30	2.6	Intro to Similarity, Day 2		
WED 8/31	2.7	Review for Quiz!		Finish Quiz Review & DM!
THURS 9/1	2.8	**QUIZ** – Transversals & Similarity		
FRI 9/2	2.9	Triangle Similarity	2 – 4	DeltaMath 2.2 due 9/12
MON 9/5	----	**LABOR DAY**	----------	
TUES 9/6	2.10	Triangle Similarity, Day 2	5 – 8	
WED 9/7	2.11	Triangle Similarity Application	9 – 10	
THURS 9/8	2.12	Algebraic & Similarity Proofs	11 – 12	
FRI 9/9	2.13	Math Libs! Quiz Review!	13 – 15	Finish Quiz Review & DM
MON 9/12	2.14	**QUIZ** – Similar Triangles	----------	DeltaMath 2.3 due 9/19
TUES 9/13	2.15	Proportional Parts and Midsegments	16 – 17	
WED 9/14	2.16	Triangle Bisector Theorem & Right Triangle Similarity Theorem	18 – 19	
THURS 9/15	2.17	Test Review Activity	Test Review 20 – 23	
FRI 9/16	2.18	4-3-2-1 Test Review	Test Review 20 – 23	Finish Test Review & DM
MON 9/19	2.19	**TEST TODAY!!!! GOOD LUCK!!!**		

Agenda is subject to change!!!

Geometry – DAY 2.9 **Name: ______________________**
AA, SSS, and SAS Similarity **Date____________________**

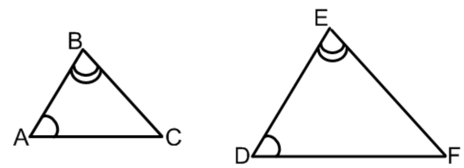
There are three ways to prove that two triangles are <u>similar</u>:

1. ____
2. ____
3. ____

Angle-Angle Similarity Postulate (AA~)

If two ____________ of one triangle are congruent to two _____________ of another triangle, then the triangles are ________________.

WE SAY $\Delta ABC \sim \Delta$______ BY AA~.
WHAT DO YOU KNOW ABOUT $\angle C$ AND $\angle F$? WHY?



____

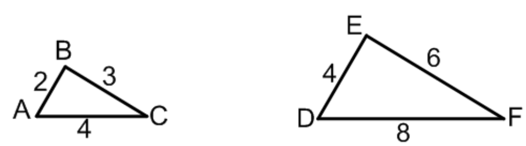
What do you know about the corresponding sides? _____________________________________

Why? ____________________________________

Side-Side-Side Similarity (SSS ~)

If three ________ of one triangle are proportional to three corresponding ________ of another triangle, then the triangles are similar.

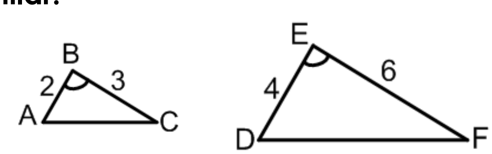
Since 2/4 = 3/6 = 4/8, then $\Delta ABC \sim \Delta DEF$.



Side-Angle-Side Similarity (SAS~)

If two sides of one triangle are proportional to two sides of another triangle and their ___________________ are congruent, then the triangles are similar.

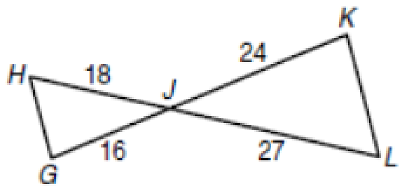
Since 2/4 = 3/6 and $\angle B \cong \angle E$, then $\Delta ABC \sim \Delta DEF$.



Classwork! Determine if the triangles are similar. If they are, complete the similarity statement.

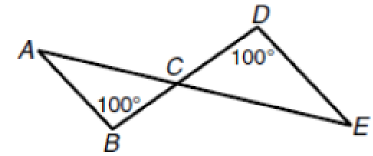
1. $\Delta GHJ \sim \Delta$________

by ________



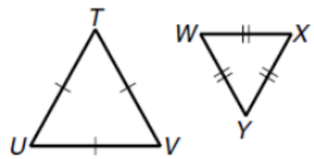
2. $\Delta ABC \sim \Delta$________

by ________



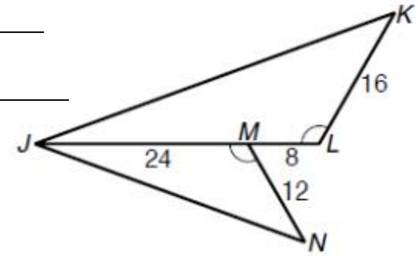
3. $\Delta TUV \sim \Delta$________

by ________



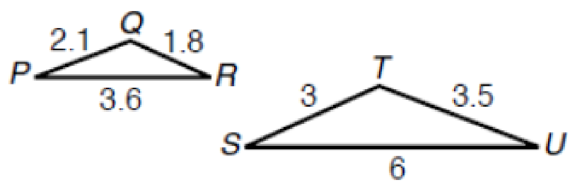
4. $\Delta JKL \sim \Delta$________

by ________

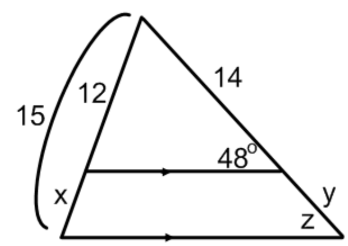


5. $\Delta PQR \sim \Delta$________

by ________

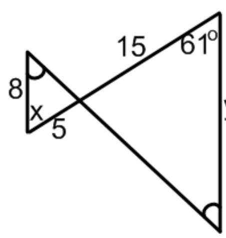


Verify that the triangles are similar, then solve for the variables.



6. $\Delta\sim$ ________

x = ______ y = ______

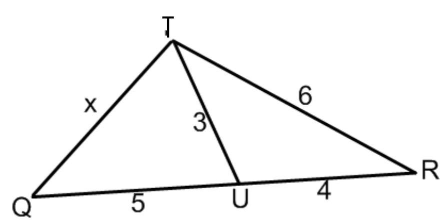


7. $\Delta\sim$ ________

x = ______ y = ______ z = ______

8. $\Delta QTR \sim \Delta$________ by ________

x = ______



****Challenge Problem**

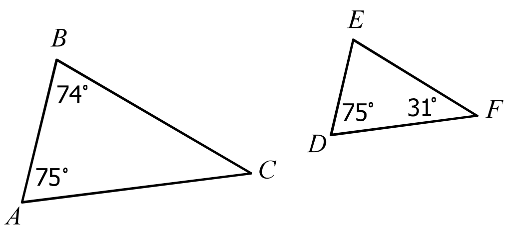
Triangle Similarity

AA~
Angle-Angle Similarity

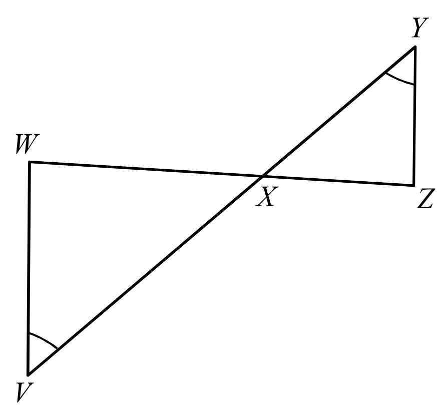
If two corresponding angles are congruent, then the triangles are similar.

Determine if the examples below are similar by AA~. If yes, write a similarity statement.

1)



2)

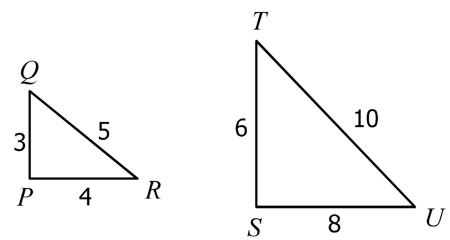


SSS~
Side-Side-Side Similarity

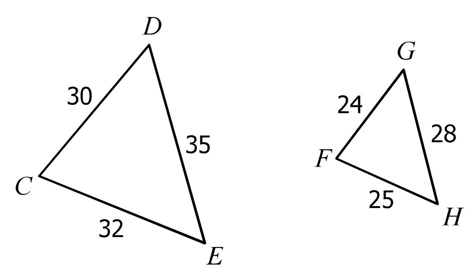
If all corresponding sides are proportional, then the triangles are similar.

Determine if the examples below are similar by SSS~. If yes, write a similarity statement.

3)



4)

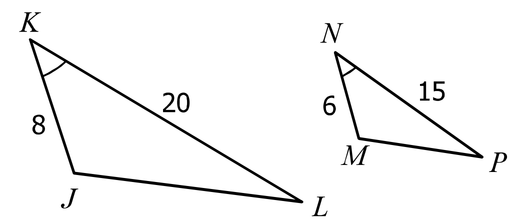


SAS~
Side-Angle-Side Similarity

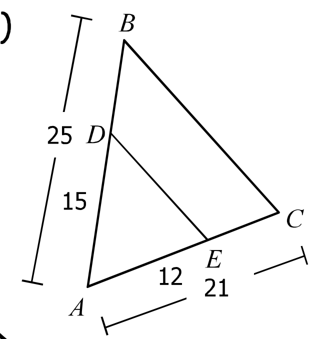
If two corresponding sides are proportional and the included angles are congruent, then the triangles are similar.

Determine if the examples below are similar by SAS~. If yes, write a similarity statement.

5)



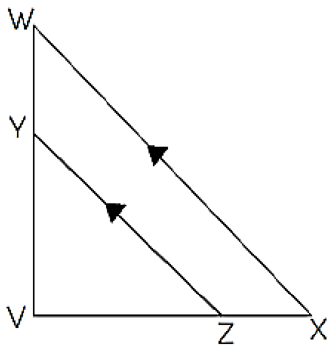
6)



Geometry – DAY 2.10 Name: ___________________________
Triangle Similarity, Day 2 Date: ____________

Try these four problems – they walk you through how to solve them!
Are these triangles similar? If so, state the similarity statement. If they are not similar, just write "not similar."

1.



A. Find any congruent angles. Mark them.

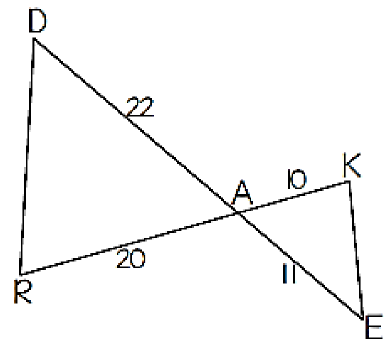
{Since you have parallel lines, think of transversal angle pairs like corresponding angles…}

B. Now, are the triangles similar? YES or NO

C. If so, state how: ______________________

D. Δ VWX ~ Δ __________

2.



A. Find any congruent angles. Mark them.

B. Are the sides proportional?

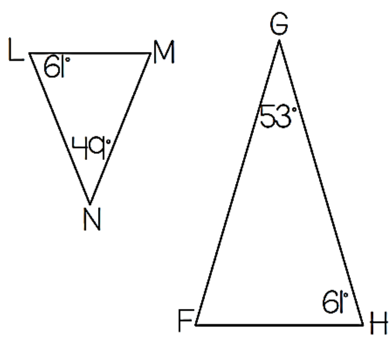
Set up your ratios HERE:

C. Now, are the triangles similar? YES or NO

D. If so, state how: ______________________

E. Δ RAD ~ Δ __________

3.



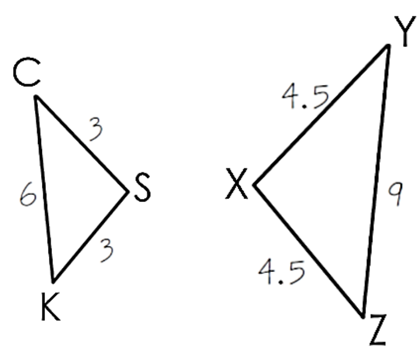
A. Can you find the missing angles? Mark them.

B. Are the triangles similar? YES or NO

C. If so, state how: ______________________

D. Δ LMN ~ Δ __________

4.



A. Are the sides proportional?

Set up your ratios HERE:

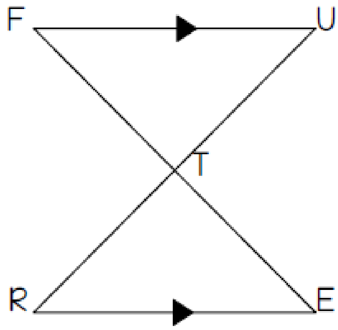
B. Are the triangles similar? YES or NO

C. If so, state how: ______________________

D. Δ KCS ~ Δ __________

CLASSWORK! Remember – you need to SHOW WORK when you are figuring out if the sides of the two triangles are proportional. Also, make sure you mark any congruent angles if possible. If they are not similar, just write "not similar."

1.

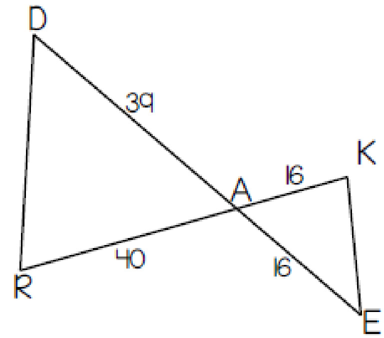


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ TRE ~ Δ _________

2.

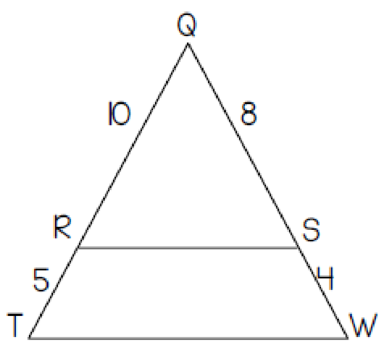


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ KEA ~ Δ _________

3.

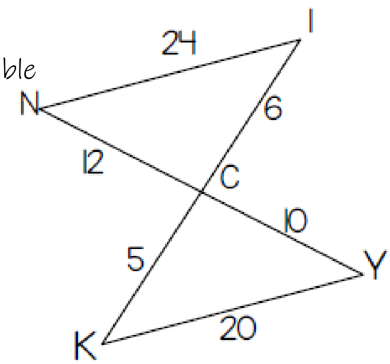


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ TQW ~ Δ _________

4. *there are two possible methods for this one*

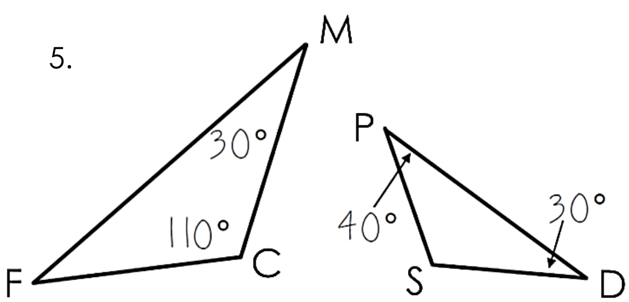


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ ICN ~ Δ _________

5.

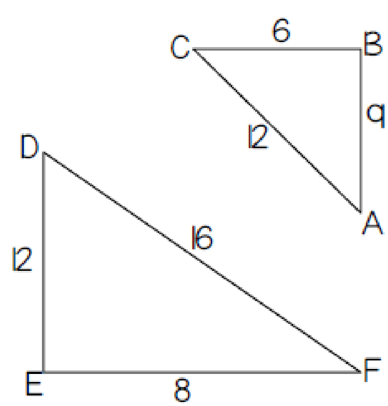


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ SPD ~ Δ _________

6.



A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

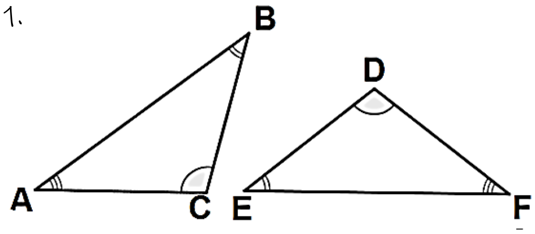
C. Δ EDF ~ Δ _________

Geometry – DAY 2.10 Name: ______________________________

Classwork – Triangle Similarity Date: ______________

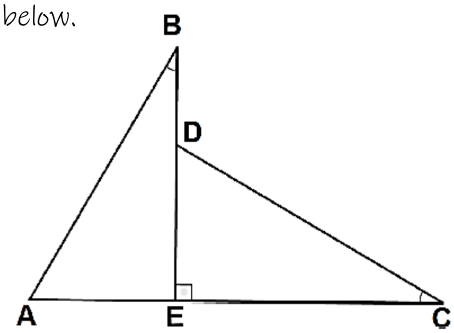
Write the congruence statement for the similar triangles below.

1.



Δ CAB ~ Δ __________

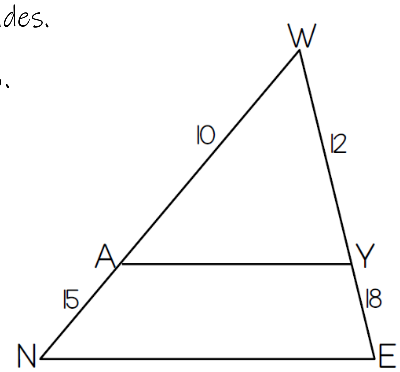
2.



Δ ABE ~ Δ __________

Determine if the two triangles are similar. If they are, state how and the similarity statement. Remember, you must mark any congruent angles you can add and you must show work for proportional sides.

3.

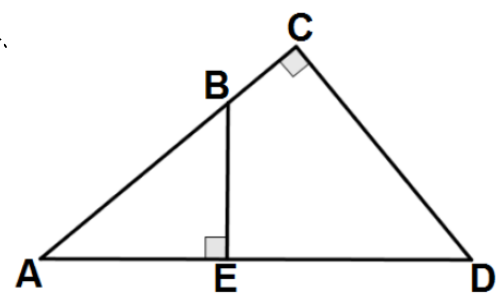


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ WAY ~ Δ ________

4.

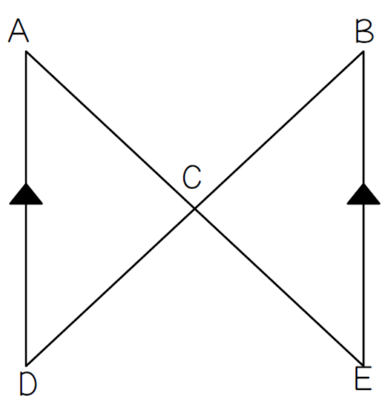


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ ABE ~ Δ ________

5.

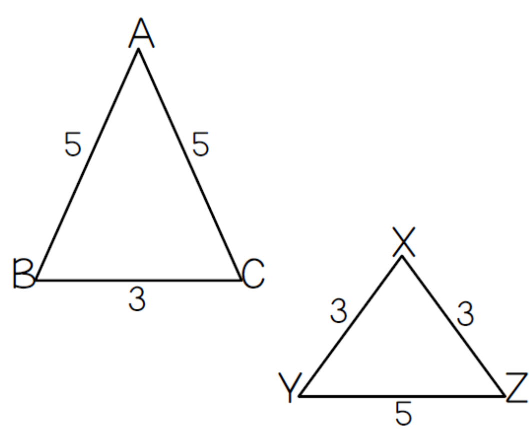


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ CBE ~ Δ ________

6.

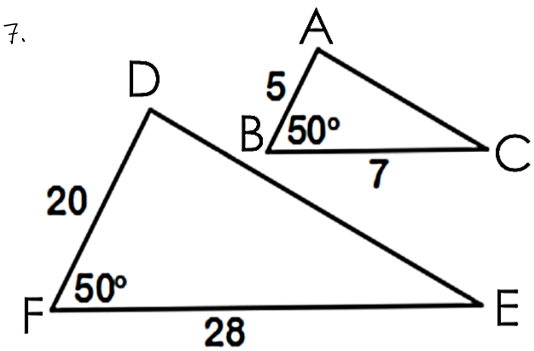


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ ABC ~ Δ ________

7.

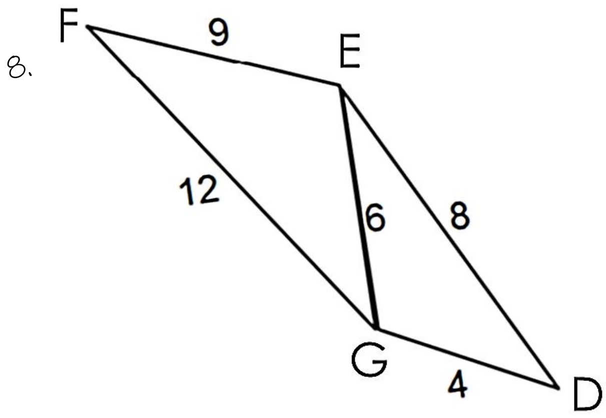


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ EDF ~ Δ ________

8.

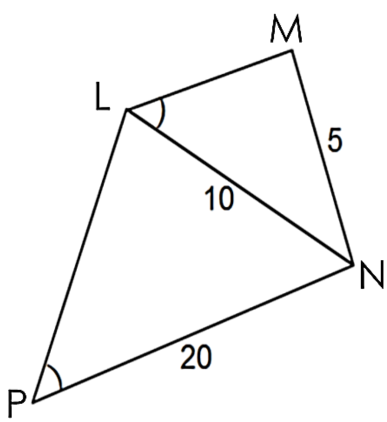


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ DGE ~ Δ ________

9.

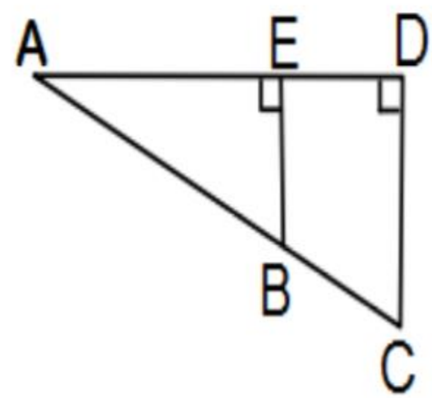


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ LNP ~ Δ ________

10.

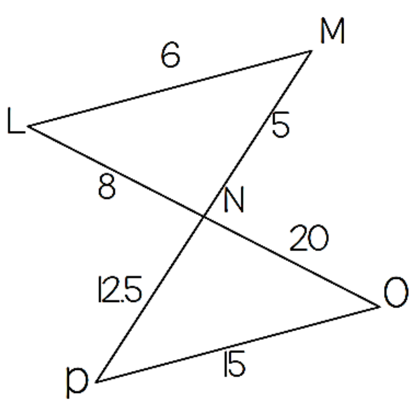


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ ABE ~ Δ ________

11.

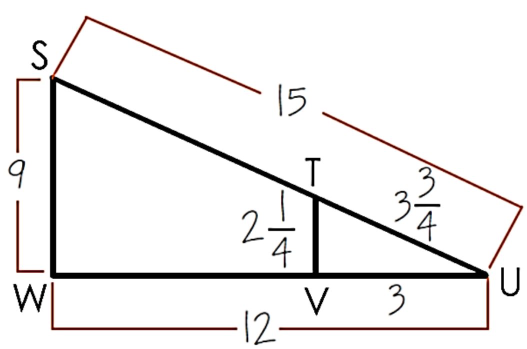


A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ LMN ~ Δ ________

12.



A. Are these triangles similar? YES or NO

B. If so, state how: ____________________

C. Δ TUV ~ Δ ________

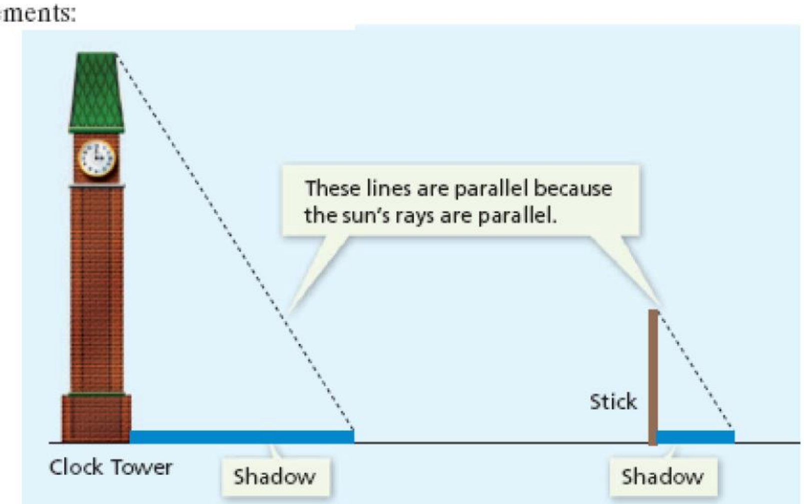
Geometry – DAY 2.11 Name: ______________________________

Video Notes – Applications of Similar Triangles Date: _____________

Using Shadows to Find Heights

Suppose you want to use the shadow method to estimate the height of a building. You make the following measurements:

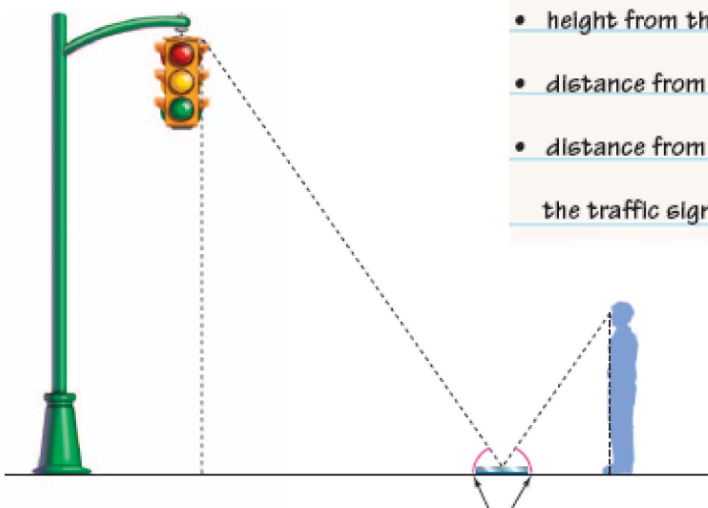
- length of the stick: 3 m
- length of the stick's shadow: 1.5 m
- length of the building's shadow: 8 m



Using Mirrors to Find Heights

Jim wants to find the height of the traffic light.

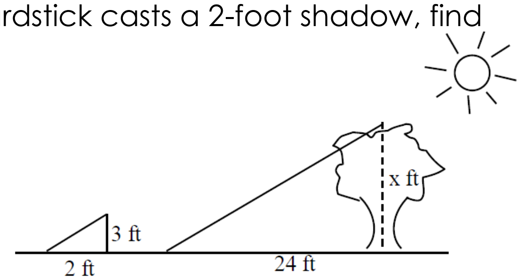
- height from the ground to Jim's eyes: 150 cm
- distance from the middle of the mirror to Jim's feet: 100 cm
- distance from the middle of the mirror to a point directly under the traffic signal: 450 cm



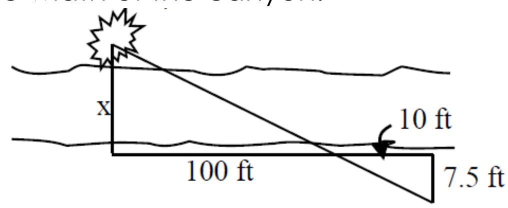
These angles are congruent because light reflects off a mirror at the same angle it arrives.

CLASSWORK:

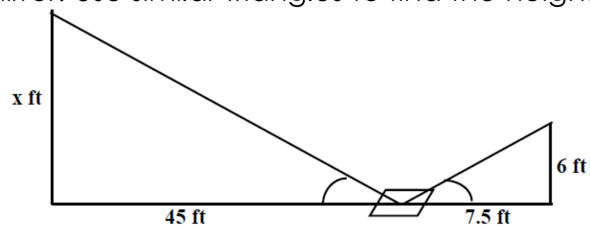
1. If a tree casts a 24-foot shadow at the same time that a yardstick casts a 2-foot shadow, find the height of the tree.



2. A bush is sighted on the other side of a canyon. Find the width of the canyon.

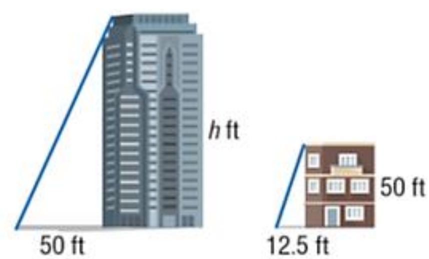


3. Ramon places a mirror on the ground 45 ft from the base of a geyser. He walks backward until he can see the top of the geyser in the middle of the mirror. At that point, Ramon's eyes are 6 ft above the ground, and he is 7.5 ft from the mirror. Use similar triangles to find the height of the geyser.

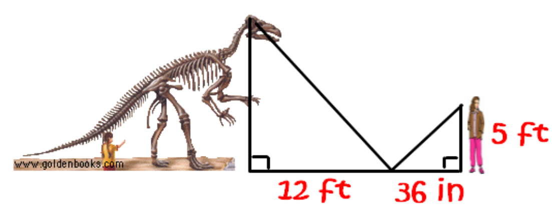


4. The Giant Wheel at Cedar Point in Ohio is one of the tallest Ferris wheels in the country at 136 feet tall. If the Giant Wheel casts a 34-foot shadow, write and solve a proportion to find the height of a nearby man who casts a 1.5-foot shadow.

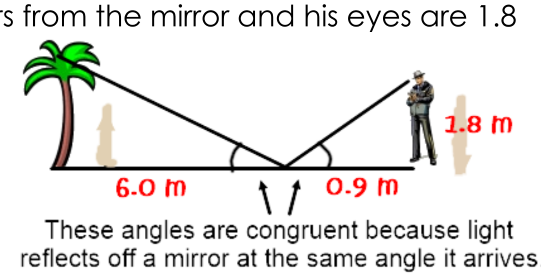
5. What is the height of the building?



6. You use a mirror to estimate the height of the dinosaur skeleton. According to the laws of optics, the light reflects off a mirror at the same angle from which it strikes the mirror. How tall is the dinosaur?



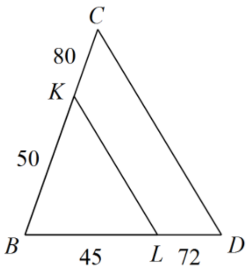
7. Lamar Presley is planning to landscape his yard. First he needs to calculate the height of a palm tree in the backyard. He sights the top of the tree in a mirror that is 6.0 meters from the tree. It is on the ground and faces up. Lamar is 0.9 meters from the mirror and his eyes are 1.8 meters from the ground. How tall is the tree?



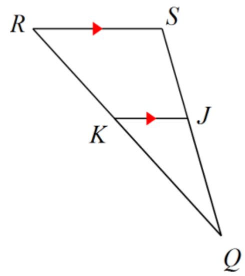
Geometry – DAY 2.12 Name: ______________________________
Proofs of Similar Triangles Date: ______________

Determine if the triangles in each pair are similar and state the property used to prove similarity.

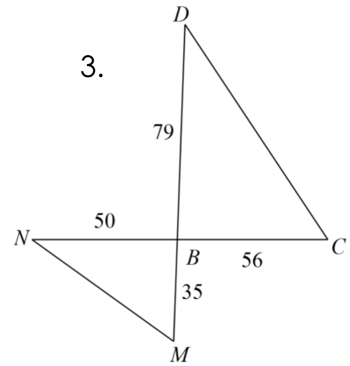
1.



2.



3.



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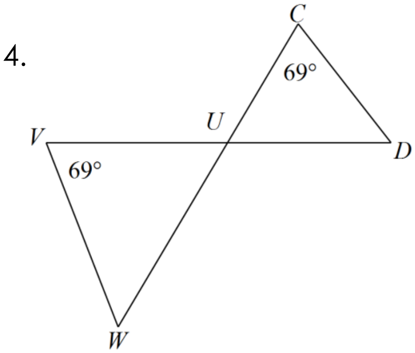
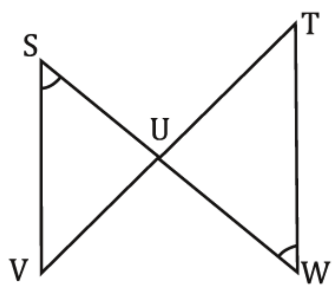


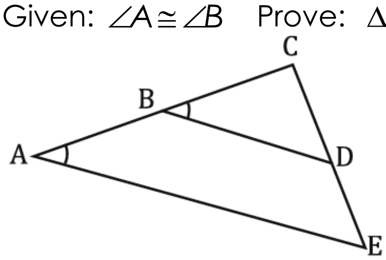
ΔBKL~Δ______ by _____ ΔRSQ~Δ_____ by _____ ΔCBD~Δ______ by _____ ΔCUD~Δ_____ by ____

5. Given: $\angle S \cong \angle W$ Prove: $\Delta SUV \sim \Delta WUT$



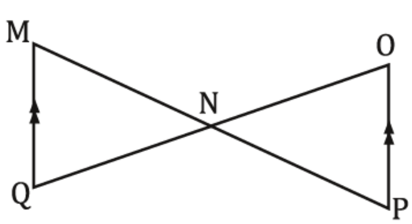
Statement	Reason
1.	1.
2.	2.
3.	3.

6. Given: $\angle A \cong \angle B$ Prove: $\Delta ACE \sim \Delta BCD$



Statement	Reason
1.	1.
2.	2.
3.	3.

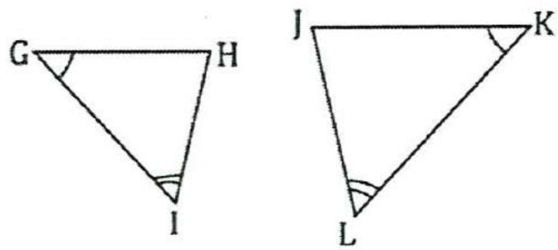
7. Given: $\overline{MQ} \parallel \overline{OP}$ Prove: $\Delta MNQ \sim \Delta PNO$



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.

You Try These!!

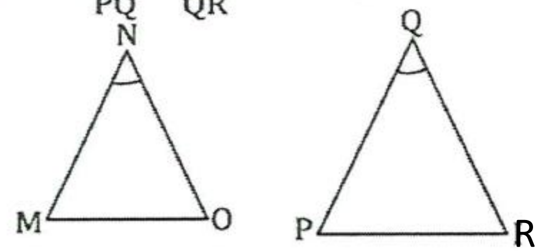
8. Given: $\angle G \cong \angle K$, and $\angle I \cong \angle L$



Prove: $\triangle GHI \sim \triangle KJL$

Statements	Reasons
1. $\angle G \cong \angle K$	1.
2.	2. Given
3. $\triangle GHI \sim \triangle KJL$	3.

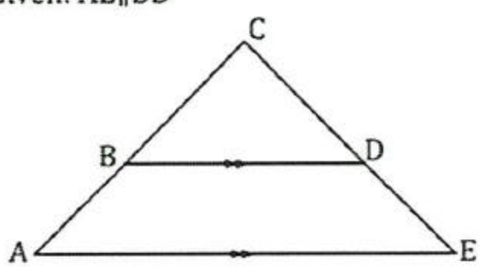
9. Given: $\frac{MN}{PQ} = \frac{NO}{QR}$, $\angle N \cong \angle Q$



Prove: $\triangle MNO \sim \triangle PQR$

Statements	Reasons
1. $\frac{MN}{PQ} = \frac{NO}{QR}$	1.
2.	2. Given
3. $\triangle MNO \sim \triangle PQR$	3.

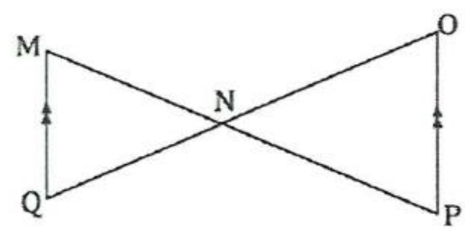
10. Given: $\overline{AE} \parallel \overline{BD}$



Prove: $\triangle ACE \sim \triangle BCD$

Statements	Reasons
1. $\overline{AE} \parallel \overline{BD}$	1.
2.	2. Corresponding Angles
3.	3.
4.	4. AA

11. Given: $\overline{MQ} \parallel \overline{OP}$



Prove: $\triangle MQN \sim \triangle OPN$

Statements	Reasons
1. $\overline{MQ} \parallel \overline{OP}$	1.
2. $\angle QMN \cong \angle OPN$	2.
3.	3. Alternate Interior
4. $\triangle MQN \sim \triangle OPN$	4.

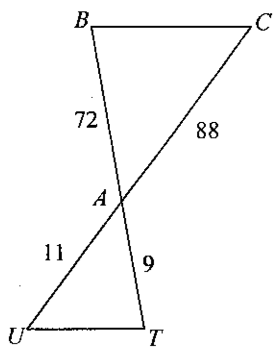
Geometry - DAY 2.13 Name________________________________

Quiz Review - Similar Triangles

Date________________ Period____

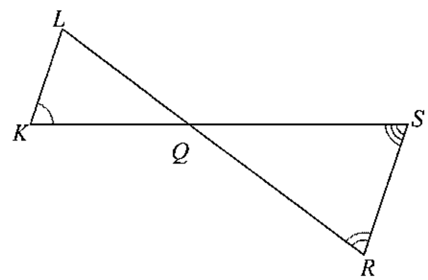
State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement. If you have to prove that sides are proportional, make sure to show your work!

1)



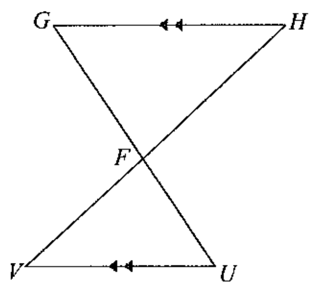
$\triangle ABC \sim$ ______

2)



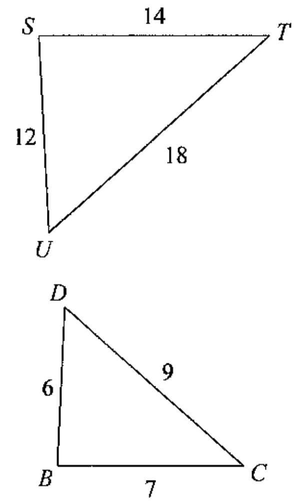
$\triangle QRS \sim$ ______

3)



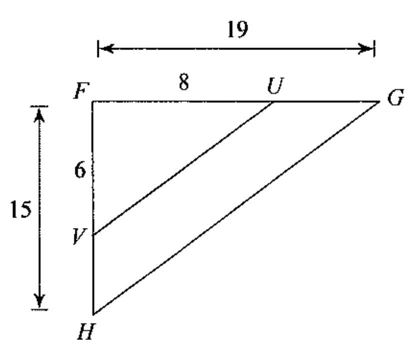
$\triangle FGH \sim$ ______

4)



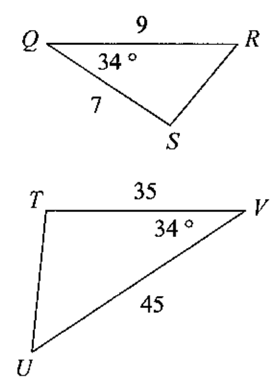
$\triangle UTS \sim$ ______

5)



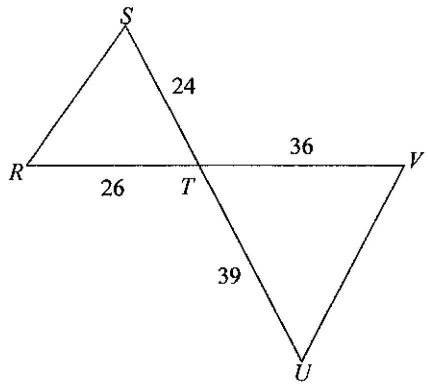
$\triangle FGH \sim$ ______

6)



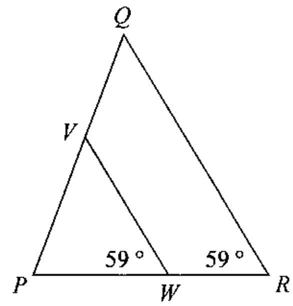
$\triangle VUT \sim$ ______

7)



$\triangle TUV \sim$ ______

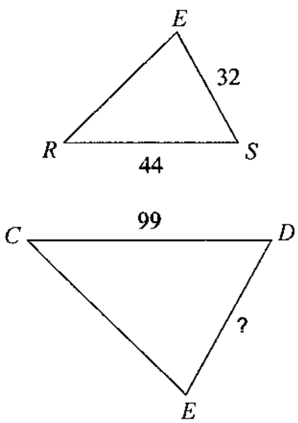
8)



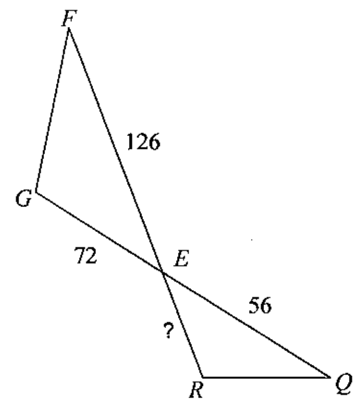
$\triangle PQR \sim$ ______

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

9) $\triangle EDC \sim \triangle ESR$

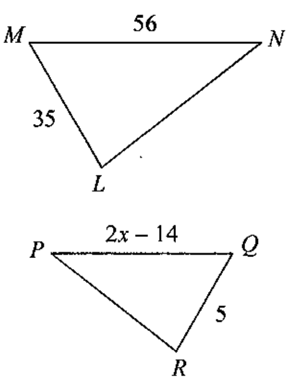


10) $\triangle EFG \sim \triangle EQR$

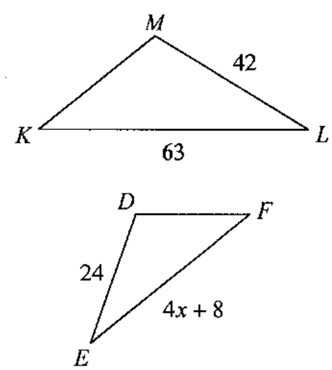


Solve for *x*. The triangles in each pair are similar.

11) $\triangle NML \sim \triangle PQR$

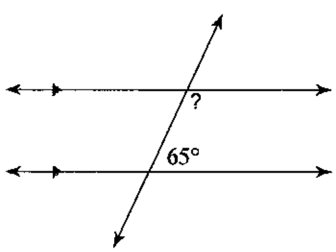


12) $\triangle KLM \sim \triangle FED$

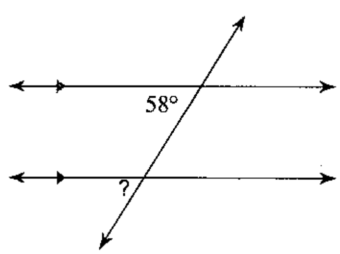


Find the measure of each angle indicated.

13)

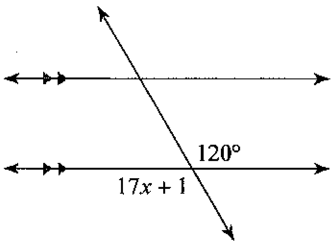


14)

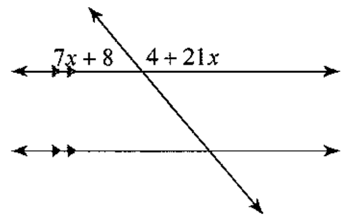


Solve for *x*.

15)

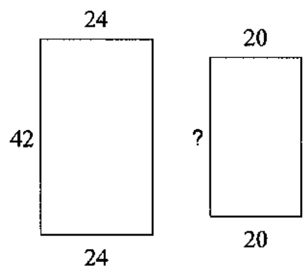


16)

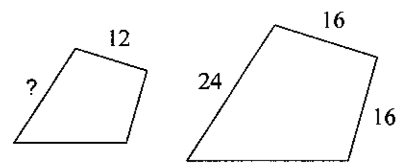


The polygons in each pair are similar. Find the missing side length.

17)

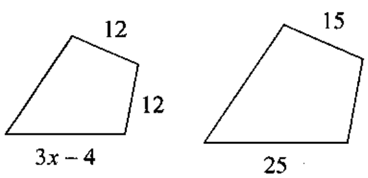


18)

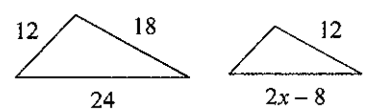


Solve for *x*. The polygons in each pair are similar.

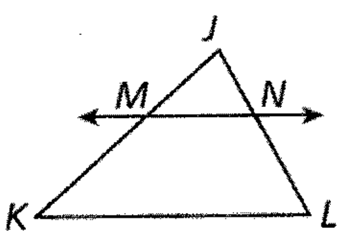
19)



20)

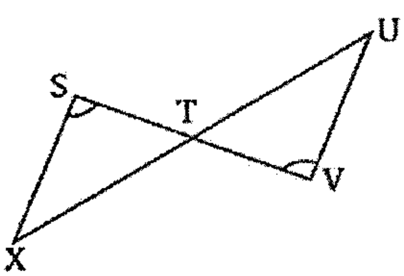


21. Given: $\overleftrightarrow{MN} \parallel \overline{KL}$ Prove: $\Delta JMN \sim \Delta JKL$



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.

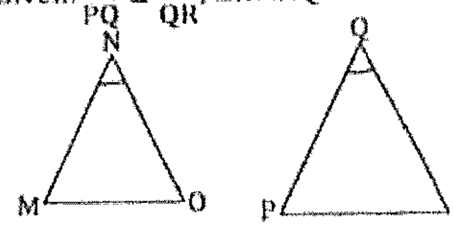
22. Given: $\angle S \cong \angle V$



Prove: $\Delta STX \sim \Delta VUT$

Statements	Reasons
1.	1. Given
2. $\angle STX \cong \angle UTV$	2.
3.	3.

23. Given: $\frac{MN}{PQ} = \frac{NO}{QR}$, $\angle N \cong \angle Q$



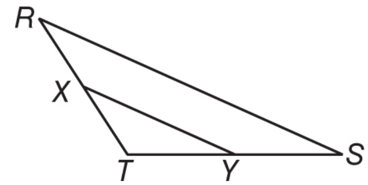
Prove: $\Delta MNO \sim \Delta PQR$

Statements	Reasons
1. $\frac{MN}{PQ} = \frac{NO}{QR}$	1.
2.	2. Given
3. $\Delta MNO \sim \Delta PQR$	3.

Geometry – DAY 2.15 Name:_______________________
Video Notes: Proportion Parts and Midsegments of Triangles Date: ____________

Proportional Parts of Triangles

- In any triangle, a line __________________to one side of a triangle separates the other two sides ________________________.
- The converse is also true.

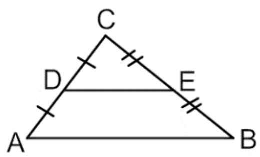


If $\overleftrightarrow{XY} \parallel \overleftrightarrow{RS}$, then $\frac{RX}{XT} = \frac{SY}{YT}$. If $\frac{RX}{XT} = \frac{SY}{YT}$, then $\overleftrightarrow{XY} \parallel \overleftrightarrow{RS}$.

$$\frac{Part}{Part} = \frac{Part}{Part} \; OR \; \frac{Part}{Whole} = \frac{Part}{Whole}$$

Midsegment of a Triangle

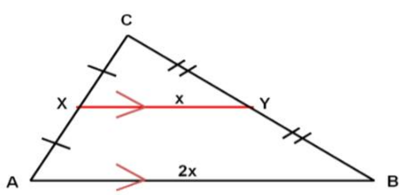
A ________________ of a triangle is a segment joining the midpoints of the two sides of a triangle.



________ is a midsegment of ΔABC

Triangle Midsegment:

1. ____
2. ____
3. ____

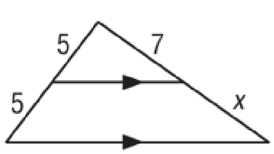


$$\overline{AB} \parallel \overline{XY}$$

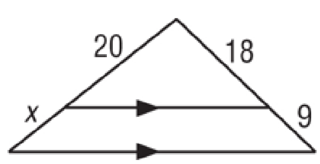
$$XY = \frac{1}{2}AB \text{ or } AB = 2(XY)$$

CLASSWORK Proportional Parts Practice:

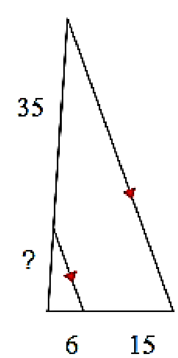
1.



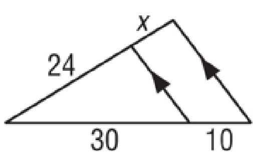
2.



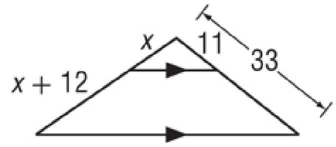
3.



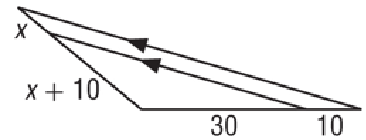
4.



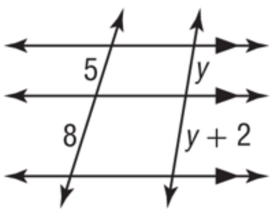
5.



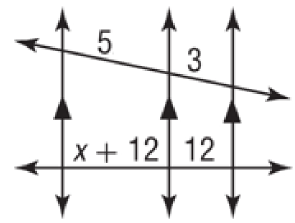
6.



7.

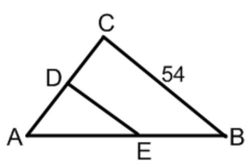


8.

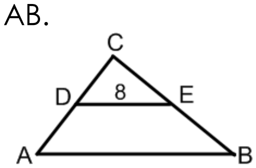


CLASSWORK Midsegments Practice:

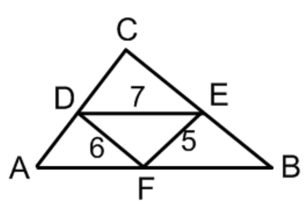
1. Given DE is the length of the midsegment. What is its length?



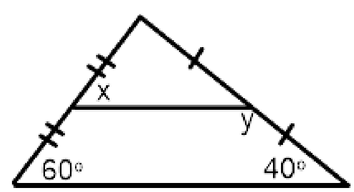
2. Given DE is the length of the midsegment. Find AB.



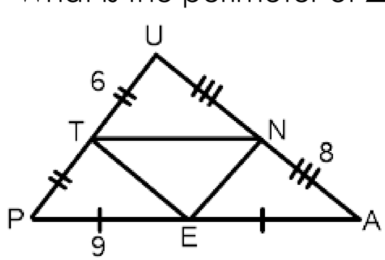
3. Given DE, DF, and FE are the lengths of midsegments. Find the perimeter of $\triangle ABC$. How does this compare to the perimeter of $\triangle DEF$?



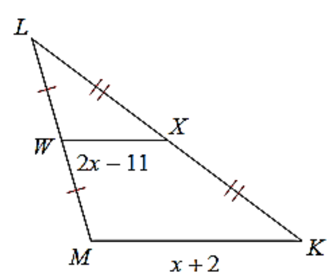
4. Solve for x and y.



5. What is the perimeter of $\triangle TEN$?



6. Solve for x.

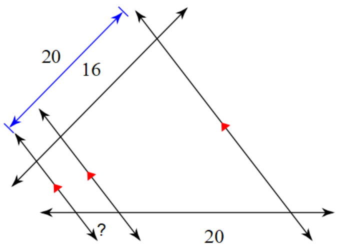


Geometry – DAY 2.16 Name: ______________________________

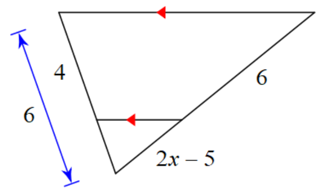
Triangle Bisector & Right Triangle Similarity Theorems Date: ___________

WARM-UP:

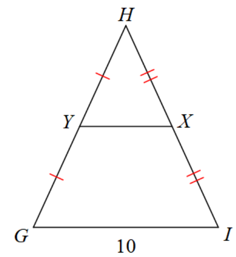
1. Solve for the ?.



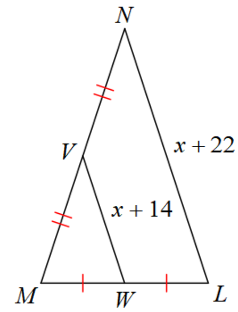
2. Solve for x.



3. XY =

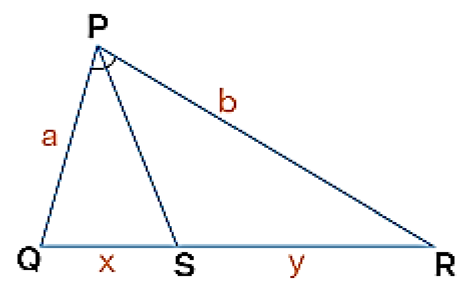


4. Solve for x.



Triangle Bisector Theorem:

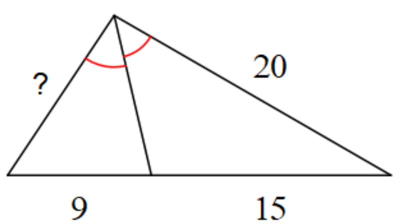
the ________________ of any angle inside a triangle divides the opposite side into two parts _________________________ to the other two sides of the triangle which contain the angle.



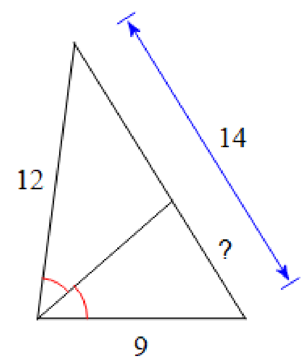
$$\boxed{\frac{a}{b} = \frac{x}{y}}$$

Let's Try!

1.

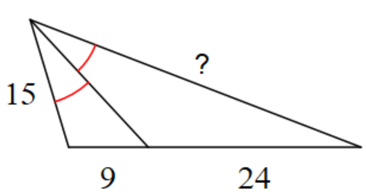


2.

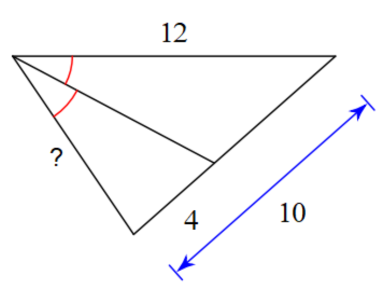


You're Turn!!

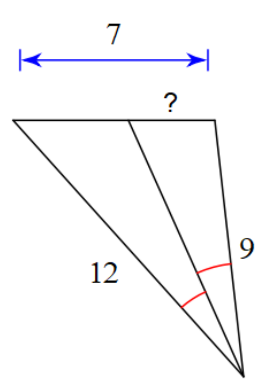
3.



4.



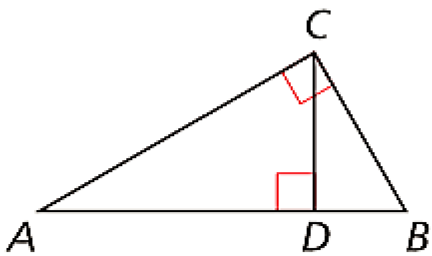
5.



Right Triangle Similarity Theorem:

If the ______________________ is drawn to the hypotenuse of a right triangle, then the two triangles formed are __________________ to the original triangle and to each other.

Geometric Mean Theorem: In a right triangle, if the altitude drawn from the right angle to the hypotenuse divides the hypotenuse into two segments, then the length of the altitude is the geometric mean of the lengths of the two segments.

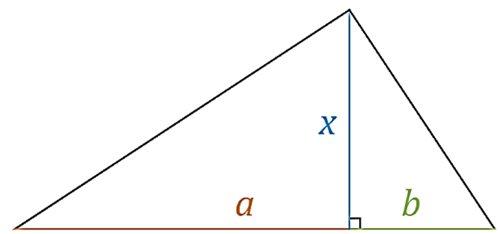


$\Delta CBD \sim \Delta ABC$

$\Delta ACD \sim \Delta ABC$

and

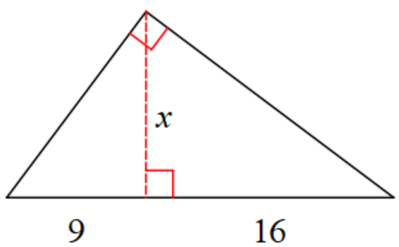
$\Delta CBD \sim \Delta ACD$



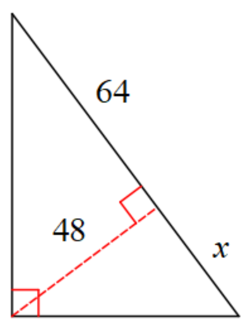
$$\frac{a}{x} = \frac{x}{b}$$

Let's Try!!

1.

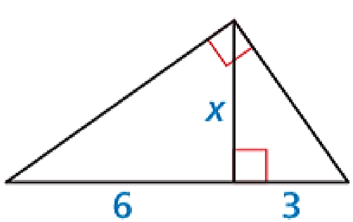


2.



You're Turn!!

3.



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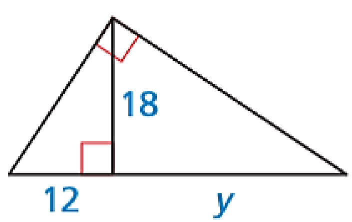

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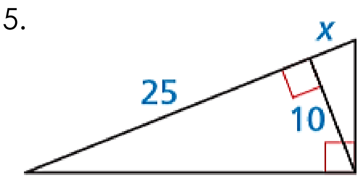
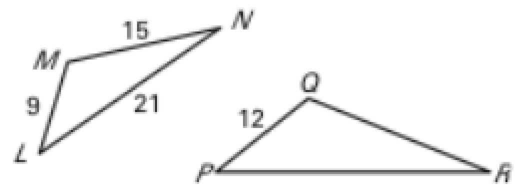


Geometry – DAY 2.17 **Name:** ____________________________
Test Review – Similar Figures **Date:** ________________

1. Given that $\Delta MAX \sim \Delta IZY$. Complete the following:

   a. $\angle M \cong$ ______ b. $\frac{AX}{ZY} = \frac{XM}{}$ c. $\angle Z \cong$ ______ d. $\Delta ZIY \cong$ ______

2. Given $\Delta LMN \sim \Delta PQR$. Complete the following:



   a. Scale factor of ΔLMN to ΔPQR. __________

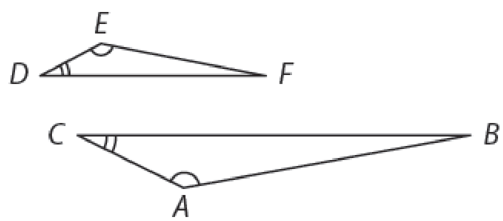
   b. QR = __________ and PR = __________.

   c. What is the ratio of the perimeters? ______________________

   d. If $m\angle P = 40°$ and $m\angle Q = 115°$, then $m\angle R =$ ________, $m\angle L =$ ________, and $m\angle M =$ ________

3. If two polygons are similar, the ratio of their areas is equal to the ___________ of the scale factor.

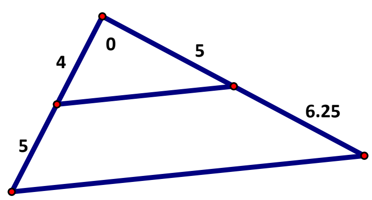
4. Write a similarity statement.



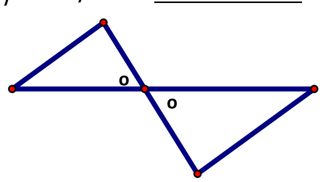
5. Which theorems are used to prove that two triangles are similar?

6. Are the following pairs of triangles similar? If they are, then name their similarity criteria. (SSS~, SAS~, AA~)

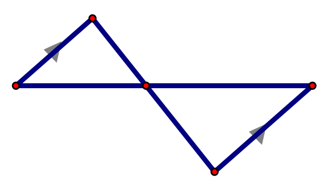
a) Yes / No __________



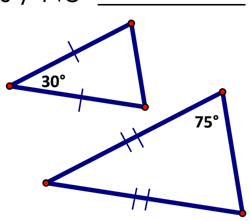
b) Yes / No __________



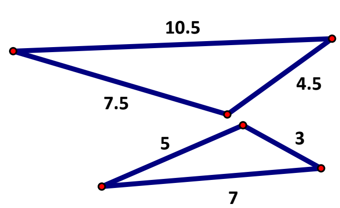
c) Yes / No __________



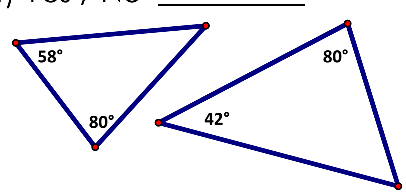
d) Yes / No __________



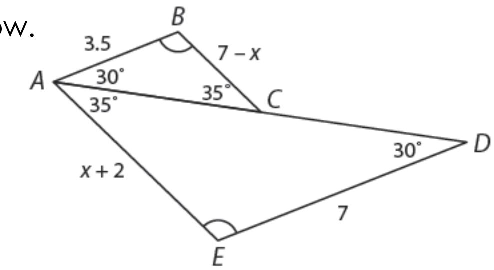
e) Yes / No __________



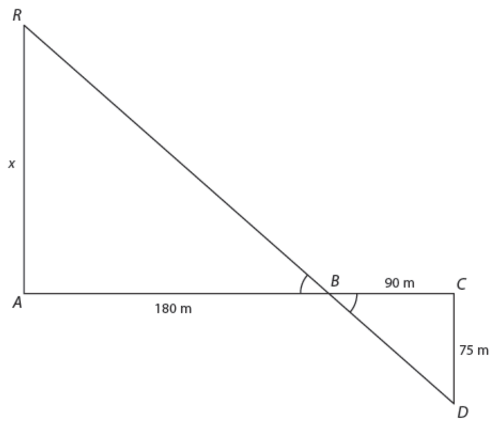
f) Yes / No __________



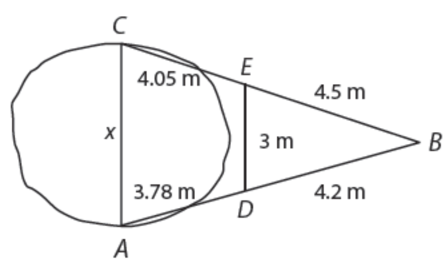
7. Find x and the length of the missing sides in the diagram below.



8. Finding the distance across a canyon can often be difficult. A drawing of similar triangles can be used to make this task easier. Use the diagram to determine $\overline{AR}$, the distance across the canyon.

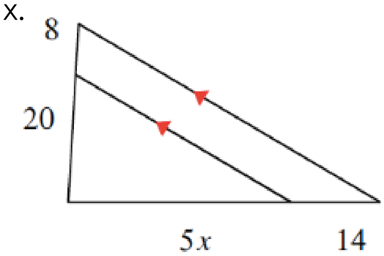


9. To measure $\overline{BC}$, the distance across a crater, an archaeologist stands at point A and locates points B, C, D, and E. What is the distance across the crater?

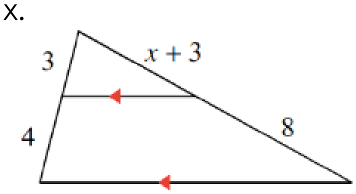


10. Rebecca is 5 feet 5 inches tall and is standing near the Space Needle in Seattle, Washington. She casts a 13 inch shadow at the same time that the Space Needle casts a 121 foot shadow. How tall is the Space Needle?

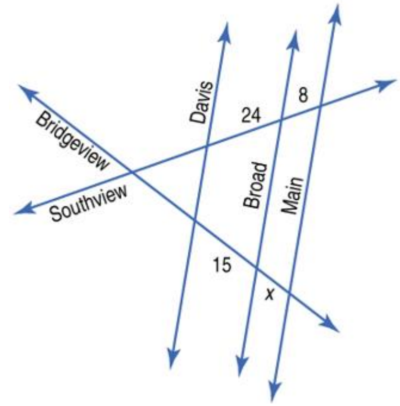
11. Find x.



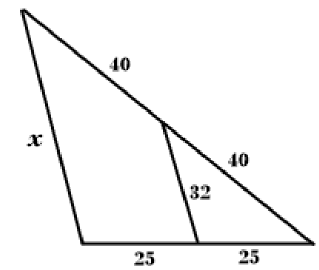
12. Find x.



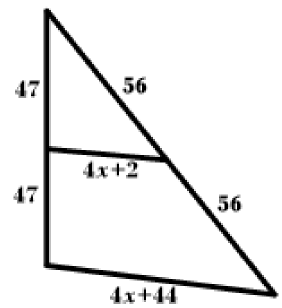
13. Davis, Broad, and Main Streets are parallel. Find x.



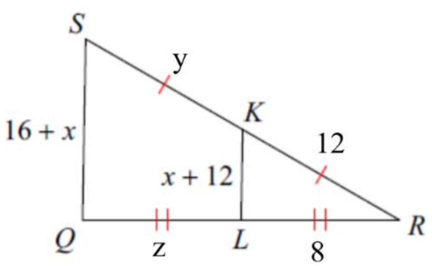
14. Find the value of x.



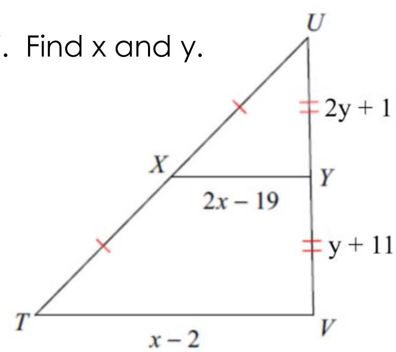
15. Find the length of the midsegment.



16. Find x, y, and z.

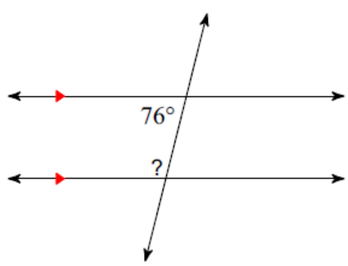


17. Find x and y.



For numbers 18 – 25, name the angle pair, whether they are congruent or supplementary, and then solve for x or the missing angle.

18.



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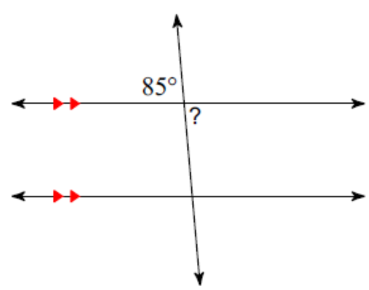

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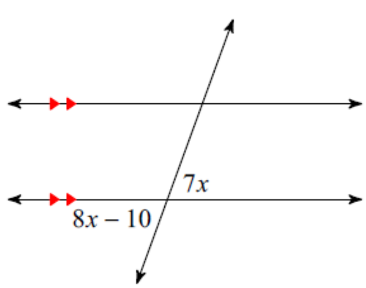

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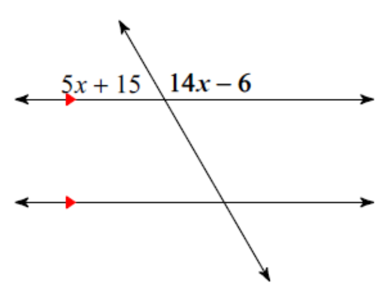

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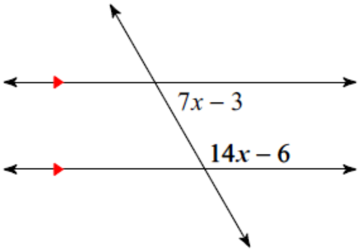

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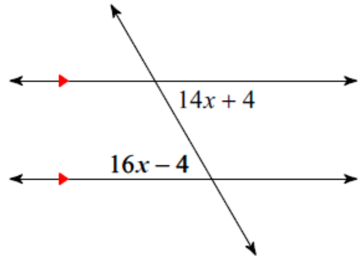

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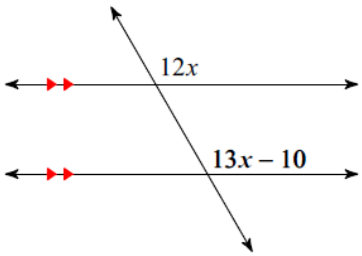

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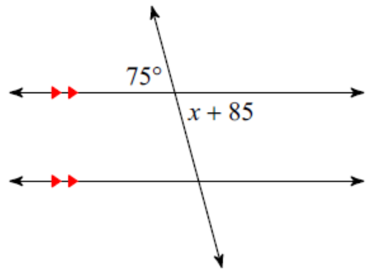
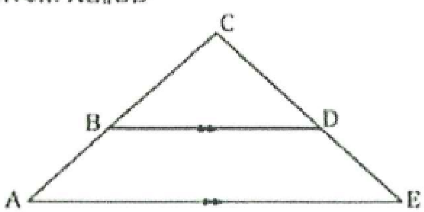


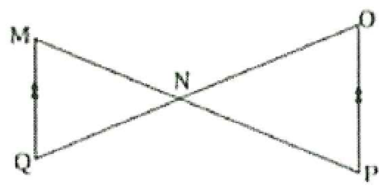
26. Given: $\overline{AE} \parallel \overline{BD}$



Prove: $\triangle ACE \sim \triangle BCD$

Statements	Reasons
1)	1)
2)	2)
3)	3)
4)	4)

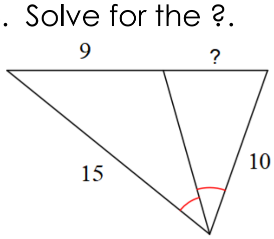
27. Given: $\frac{MN}{PN} = \frac{QN}{ON}$



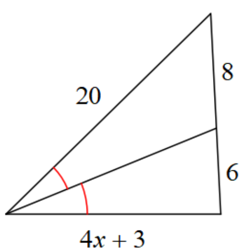
Prove: $\triangle MQN \sim \triangle OPN$

Statements	Reasons
1)	1)
2)	2)
3)	3)

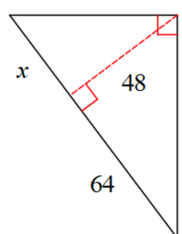
28. Solve for the ?.



29. Solve for x.



30. Solve for x.



31. Solve for x.