Unit 2: Similarity and Trig

Monday	Tuesday	Wednesday	Thursday	Friday
1 Dilations and Scale Factor	2 Midsegment and Proportionality Theorem	3 Delta Math	4 Prove Similar and QUIZ	5 SOH CAH TOA Ratios
8 SOH CAH TOA Sides and Angles	9 SOH CAH TOA CoFunctions and Applications/Delta Quiz	10 Delta Math	11 Review	12 Test

Notes

Name: _____ Date: _____

Ratios in Similar Polygons: Notes

Fill in the blanks to complete each definition.

1. A similarity ratio is the ratio of the lengths of the _____ sides of two similar polygons.

2. Two polygons are similar if and only if their corresponding angles are _____ and their corresponding sides are _____.

3. Figures that are similar have the same shape but not necessarily the same _____.

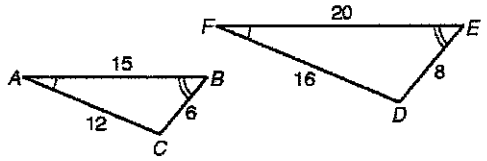
Use the figure for Exercises 4 and 5. The triangles are similar.

4. Name the pairs of congruent angles.

   $\angle A \cong$ _____

   $\angle B \cong$ _____

   $\angle C \cong$ _____



5. Write the corresponding side lengths in the proportion. $\frac{AB}{\quad} = \frac{\quad}{DE} = \frac{\quad}{FD}$

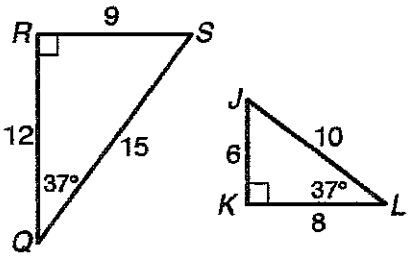
Use the figure to the right for Exercises 6 and 7. The triangles are similar.

6. Circle the correct similarity statement.

   $\Delta QRS \sim \Delta KJL$ $\Delta RSQ \sim \Delta KJL$ $\Delta QSR \sim \Delta LKJ$

7. Write the corresponding side lengths in the proportion.

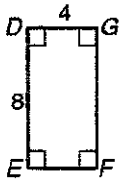
   $\frac{RS}{\quad} = \frac{\quad}{KL} = \frac{\quad}{\quad}$

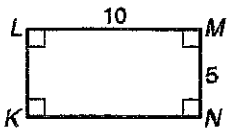


Use the figure to the right for Exercise 8.

8. Substitute numbers for the side lengths and reduce each ratio to simplest form.

   $\frac{DG}{MN} = \_$ $\frac{DE}{LM} = \_ = \_$





Notes

Scale Factor

Scale Factor – the ratio of corresponding sides

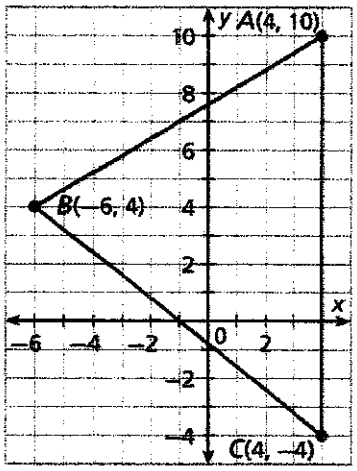
- When scale factor is greater than 1, the shape gets *bigger and* this is called an _____.
- When scale factor is less than 1, but greater than 0, the shape gets *smaller* and this is called a _____.
- Formula: _____

Dilations

Apply the dilation D to the polygon with the given vertices. Name the coordinates of the image points. Identify and describe the transformation as an enlargement or reduction.

9. $D(x, y) \rightarrow \left(\frac{1}{2}x, \frac{1}{2}y\right)$

$A(4, 10)$, $B(-6, 4)$, and $C(4, -4)$



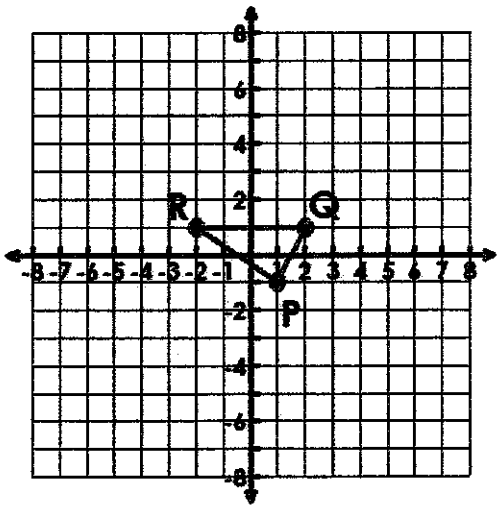
A' _____, B' _____, and C' _____

This shape is a/n _____.

The scale factor is _____.

10. $D(x, y) \rightarrow (3x, 3y)$

$P(1, -1)$, $Q(2, 1)$, $R(-2, 1)$



P' _____, Q' _____, and R' _____

This shape is a/n _____.

The scale factor is _____.

Similar Polygons

1. Corresponding angles are congruent

2. Corresponding sides are proportional

Similarity Statement

$\Delta ABC \sim \Delta DEF$

Scale Factor – the ratio of a new image to its original image

•The ratio of corresponding sides

Scale Factor

- When scale factor is greater than 1, the shape gets *bigger* (enlargement).
- When scale factor is less than 1, but greater than 0, the shape gets *smaller* (reduction).

Find the coordinates of the dilation image for the given scale factor, *k*.

Example 1:

$G(0, -2)$, $H(1, 3)$, and $I(4, 1)$; $k = 2$

All you do is multiply *k* to (x, y).

$G'(\ ,\ )$, $H'(\ ,\ )$, and $I'(\ ,\ )$

Find the coordinates of the dilation image for the given scale factor, *k*.

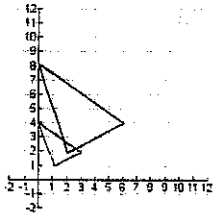
Example 2:

$L(8, -8)$, $N(0, 16)$, and $M(4, 5)$; $k = 1/4$

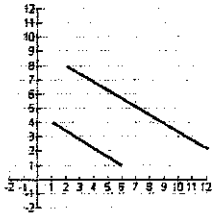
All you do is multiply *k* to (x, y).

$L'(\ ,\ )$, $N'(\ ,\ )$, and $M'(\ ,\ )$

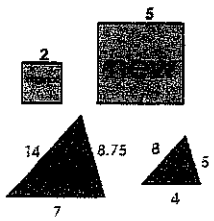
Determine Scale Factor: The Large Triangle is the Pre Image



Determine Scale Factor: The Shorter line is the Pre-Image

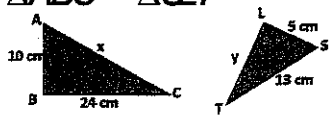


SCALE FACTOR.

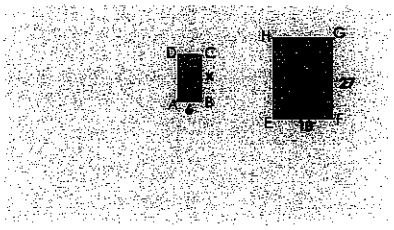


Solve for x and y.

$\Delta ABC \sim \Delta SLT$



ABCD ~ EFGH. Solve for x.



Ex. A tree cast a shadow 18 feet long. At the same time a person who is 6 feet tall cast a shadow 4 feet long. How tall is the tree?

Ratio of Similar Polygons

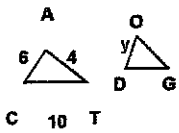
Corresponding Sides : Corresponding Sides

Or

Perimeter : Perimeter

A : B

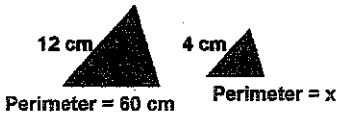
The ratio of the perimeters of two similar polygons equals the ratio of any pair of corresponding sides.



The ratio of the perimeters of CAT to DOG is 3:2

Find the value of y.

Find the perimeter of the smaller triangle.



Ratio of Similar Polygons

Area : Area

$A^2 : B^2$

Geometry 2- Similarity & Right Triangles

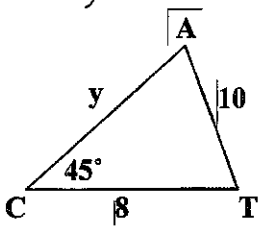
Name: _____ Date: _____

Similarity and Dilations

In the diagram, $\Delta CAT \sim \Delta DOG$. Use the diagram to find each of the following.

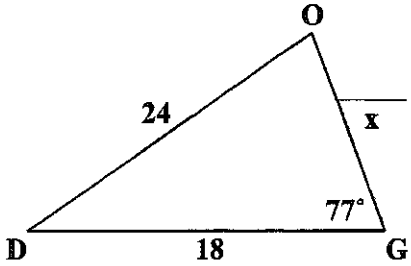
1. Scale factor of ΔCAT to ΔDOG (Simplify.)

   Scale Factor =



2. Find x and y (Show Work!)

   x = _____ y = _____



3. Find $m\angle D$ =

4. Find $m\angle O$ =

5. Find $m\angle A$ =

6. What is the ratio of the perimeter of ΔCAT to the perimeter of ΔDOG?

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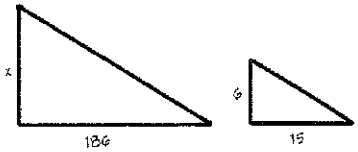
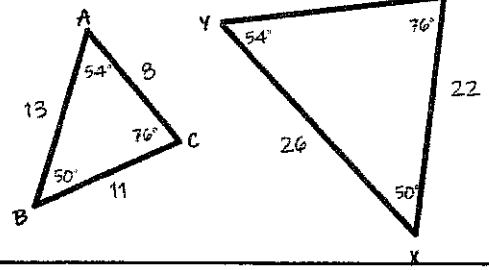
7. A boy who is 6 ft. tall cast a shadow that is 15 ft long. At the same time, a building nearby cast a shadow that is 186 ft long. How tall is the building? Draw a picture!

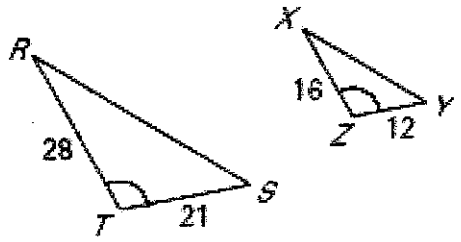


Determine why the triangles are similar (postulate or theorem), and write a similarity statement.

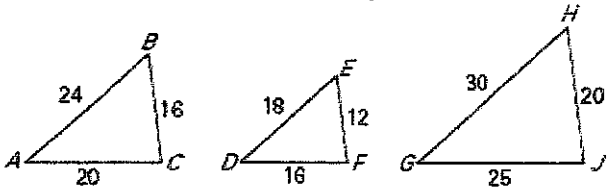
8. $\Delta BAC \sim$



9. $\Delta TRS \sim$



Determine which of the triangles (ΔDEF or ΔGHJ) is similar to ΔABC:

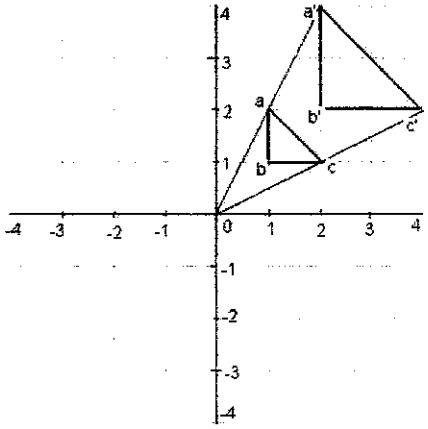


10. Complete the Similarity Statement to $\Delta CBA \sim \Delta$

11. Find the Scale Factor =

Determine whether the dilation from Figure ABC to Figure A'B'C' is a reduction or an enlargement. Then find its scale factor and simplify if possible.

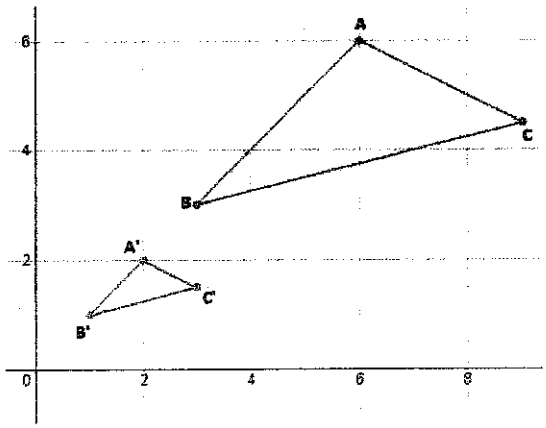
12.



Reduction or enlargement?

scale factor =

13.

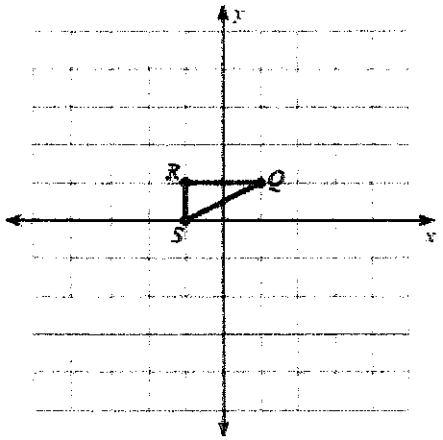


Reduction or enlargement?

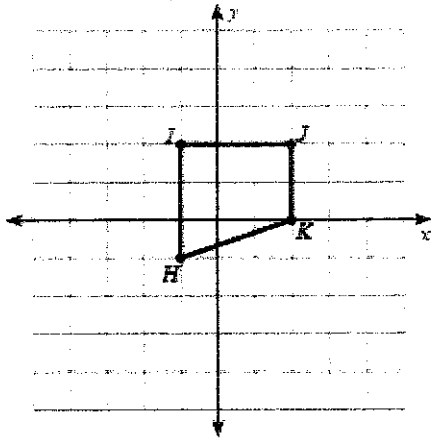
scale factor =

Graph the image of the figure using the transformation given.

14) dilation of 4 about the origin



15) dilation of $\frac{1}{2}$ about the origin



Find the coordinates of the vertices of each figure after the given transformation. Identify if it is an enlargement or reduction.

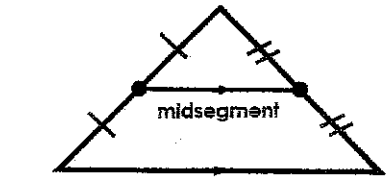
16) dilation of $\frac{1}{2}$ about the origin
R(-1, -1), S(0, 2), T(1, 2), U(2, -2)

17) dilation of 2 about the origin
Z(-1, -1), Y(-1, 2), X(1, 1)

Triangle Midsegment Theorem

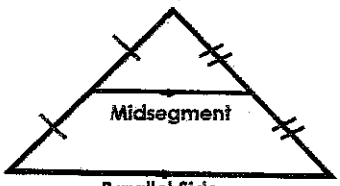
Triangle Midsegment

1. Parallel to one side of the triangle
2. Is half the length of the parallel side
3. Connects to the midpoints

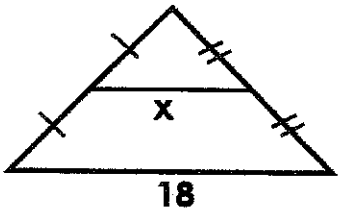


Triangle Midsegment Theorem

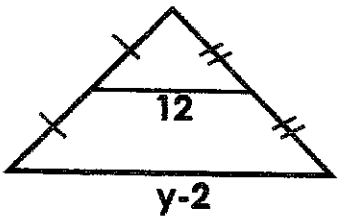
EQUATION
2(midsegment)=parallel side



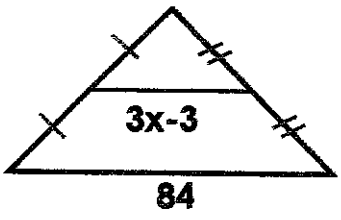
1. Solve for x.



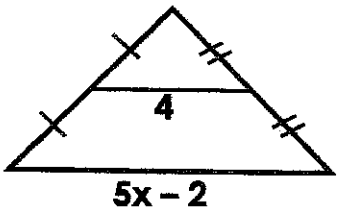
2. Solve for y.



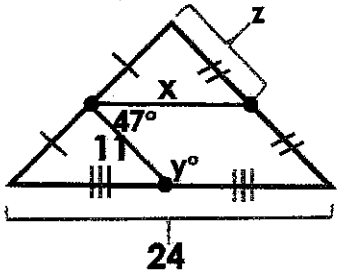
3. Solve for x.

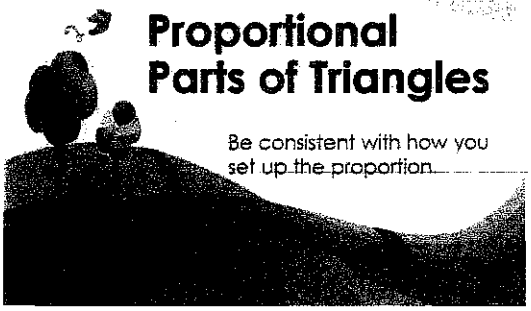


4. Solve for x.



5. Solve for the missing variables.





Proportional Parts of Triangles

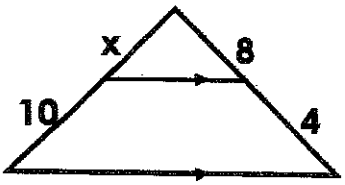
Be consistent with how you set up the proportion.

Triangle Proportionality Thm.

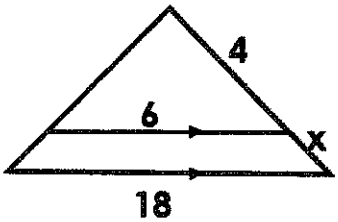
Triangle Proportionality Theorem

If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.

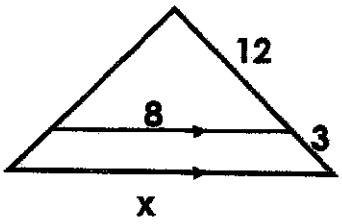
1. Solve for x.



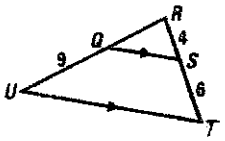
2. Solve for x.



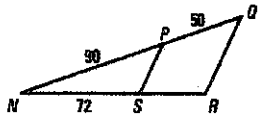
3. Solve for x.



Determine the length of RQ:



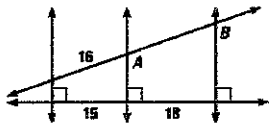
$PS \parallel QR$ Determine the Length of SR:



Theorem

If three parallel lines intersect two transversals, then they divide the transversals proportionally.

Example: find the length of AB.

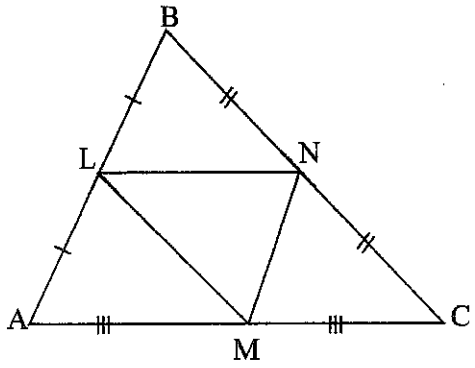


Name: _____ Date: _____

Triangle Midsegment and Proportionality Theorem

Triangle Midsegment Theorem: The segment connecting the midpoints of two sides of the triangle is parallel to the third side and half the length of the third side.

Use ΔABC, where L, M, and N are midpoints of the sides.



1. $\overline{LM} \parallel$ _____
2. $\overline{AB} \parallel$ _____
3. If AC = 20, then LN = _____
4. If MN = 7, then AB = _____
5. If NC = 9, then LM = _____
6. If LM = 3x + 7, and BC = 7x + 6, then **LM** = _____

7. If MN = x – 1, and AB = 6x – 18, then **AB** = _____

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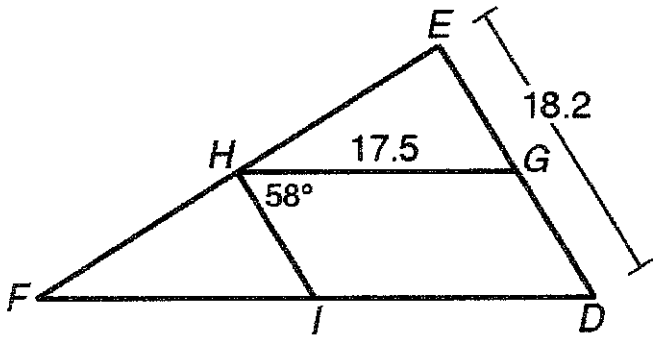
8. Find each measure. H, G, and I are all midpoints.

a) HI _____ b) DF _____

c) GE _____ d) m∠HIF _____

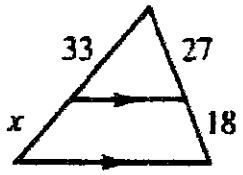
e) m∠HGD _____ f) m∠D _____



<u>Triangle Proportionality Theorem</u>: If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.

Find the value of x:

9.



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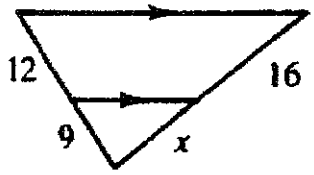

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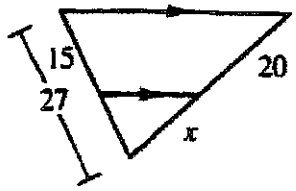

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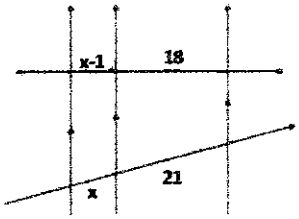

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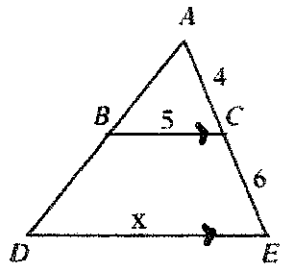
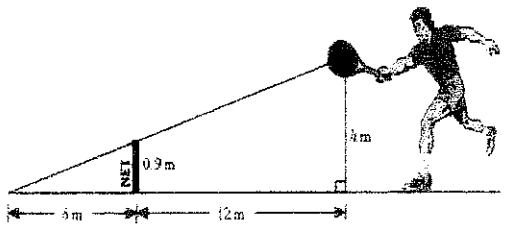


14.



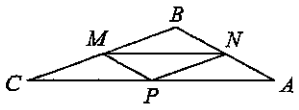
Geometry Name_____ ID: 1

Midsegment

Date_____ Period____

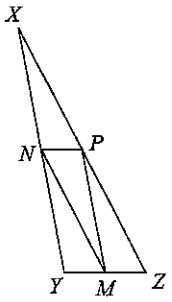
In each triangle, M, N, and P are the midpoints of the sides. Name a segment parallel to the one given.

1)



____ $\| \overline{MP}$

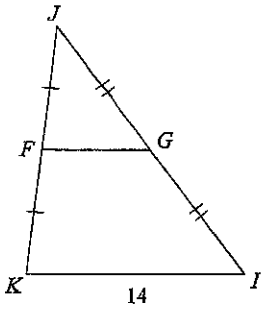
2)



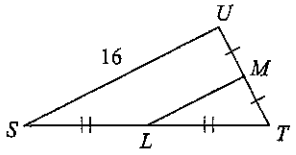
$\overline{YX} \|$ ____

Find the missing length indicated.

3) Find *FG*

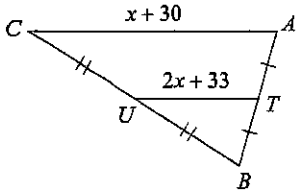


4) Find *ML*

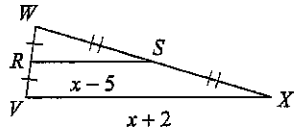


Solve for *x*.

5)

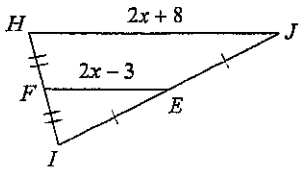


6)

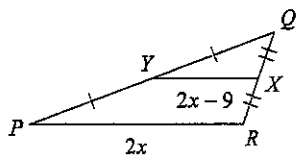


Find the missing length indicated.

7) Find *JH*



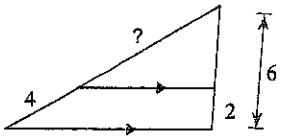
8) Find *PR*

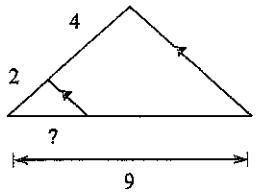


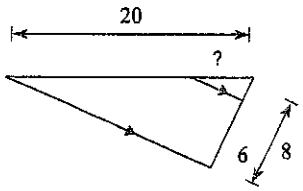
Geometry Name _____

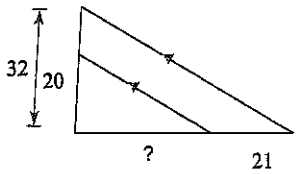
Triangle Proportionality Theorem

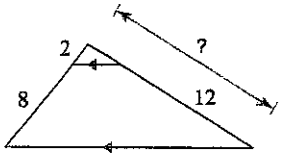
Find the missing length indicated.

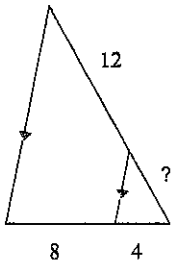
1) 

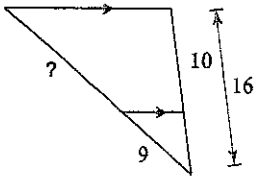
2) 

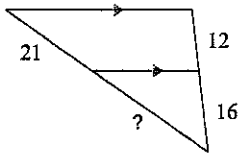
3) 

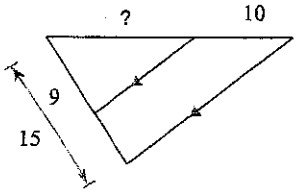
4) 

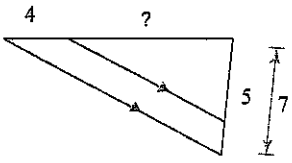
5) 

6) 

7) 

8) 

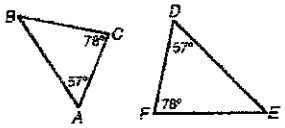
9) 

10) 

Name: _____ Date: _____

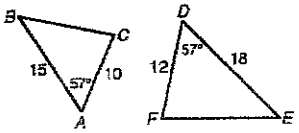
Ways to Prove Triangles are Similar

AA~ Postulate:
If two angles of one triangle are _____ to two angles of another, then the triangles are similar.



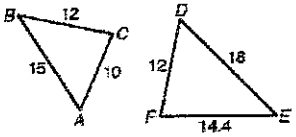
△ABC ~ △DEF

SAS~ Postulate:
If the lengths of two sides are _____ and the _____ angle is _____, then the triangles are similar.



△ABC ~ △DEF

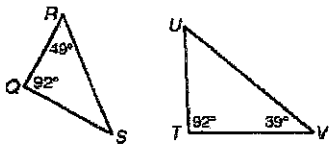
SSS~ Postulate:
If ___ _____ sides of one triangle are _____ to corresponding ____ of another triangle, then the triangles are similar.



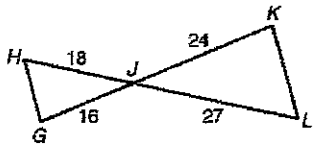
△ABC ~ △DEF

Practice: Explain why the triangles are similar (SSS~, SAS~, or AA~) and write a similarity statement.

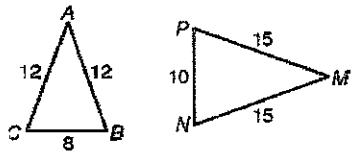
1) ΔRQS~_____ by _____



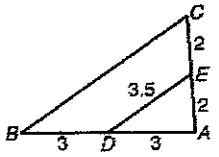
2) ΔHGJ~_____ by _____



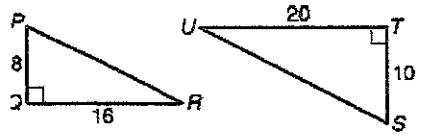
3) ΔABC~_____ by _____



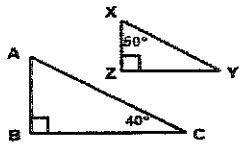
4) ΔADE~_____ by _____



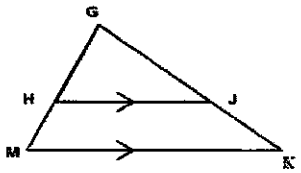
5) ΔQPR~_____ by _____



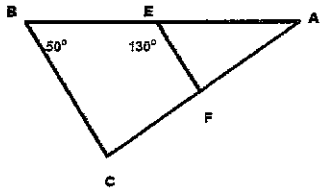
6) ΔABC~_____ by _____



7) $\Delta GHJ \sim$ _____ by _____

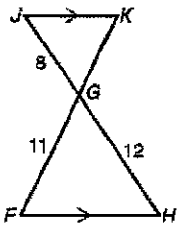


8) $\Delta AEF \sim$ _____ by _____

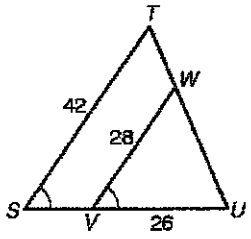


Explain why the triangles are similar (SSS~, SAS~, or AA~) and find each length.

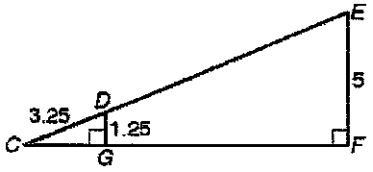
9) Similar by _____ and GK = _____



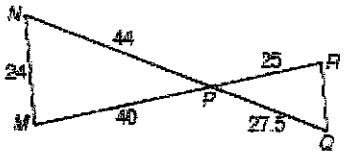
10) Similar by _____ and SU = _____



11) Similar by _____ and DE = _____



12) Similar by _____ and RQ = _____



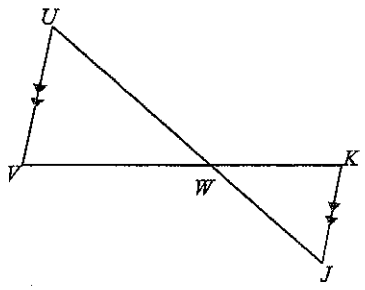
Geometry Name_____ ID: 1

Proving Triangles Similar

Date_____ Period____

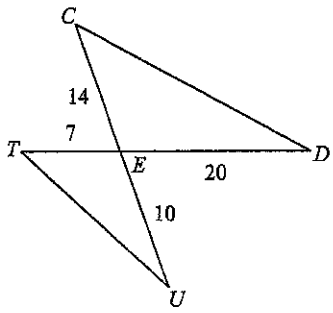
State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

1)



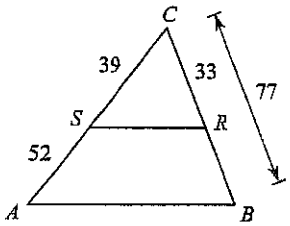
$\triangle WVU \sim$ _____

2)



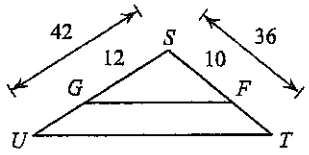
$\triangle EDC \sim$ _____

3)



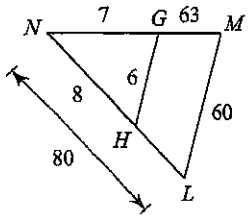
$\triangle CBA \sim$ _____

4)



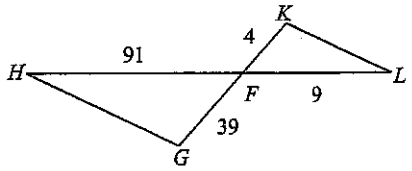
$\triangle STU \sim$ _____

5)



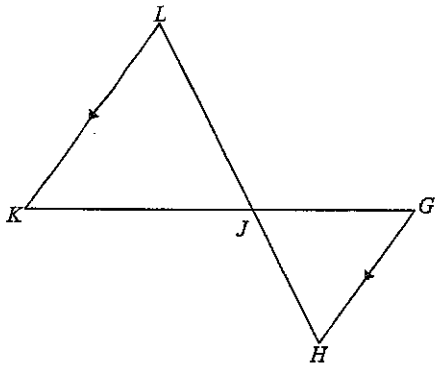
$\triangle NML \sim$ _____

6)



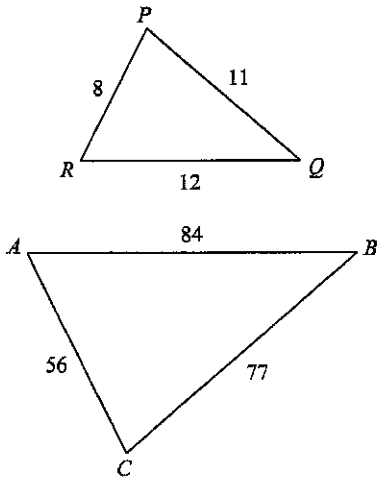
$\triangle FGH \sim$ _____

7)



$\triangle JKL \sim$ _____

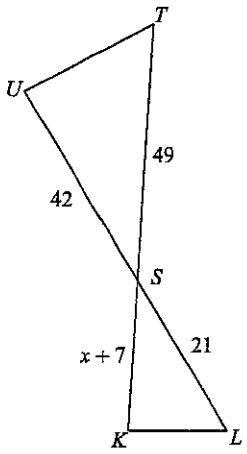
8)



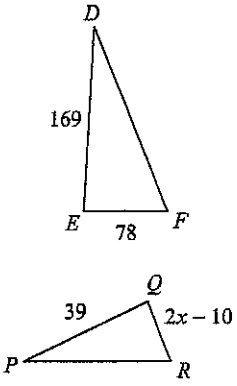
$\triangle CBA \sim$ _____

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

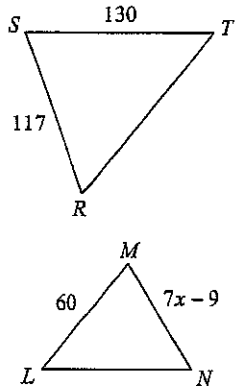
9)



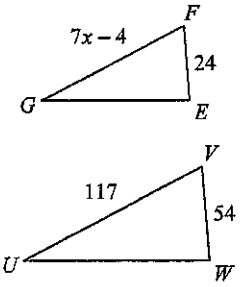
10)



11)

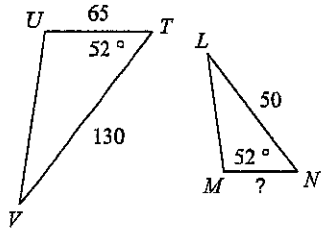


12)

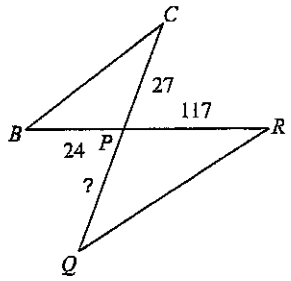


Find the missing length. The triangles in each pair are similar.

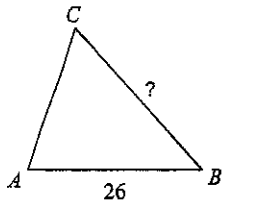
13)

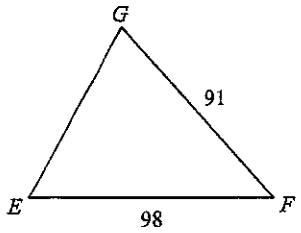


14)

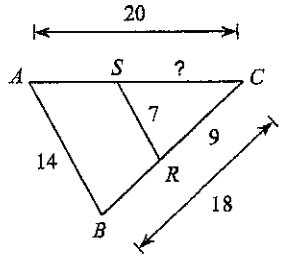


15)



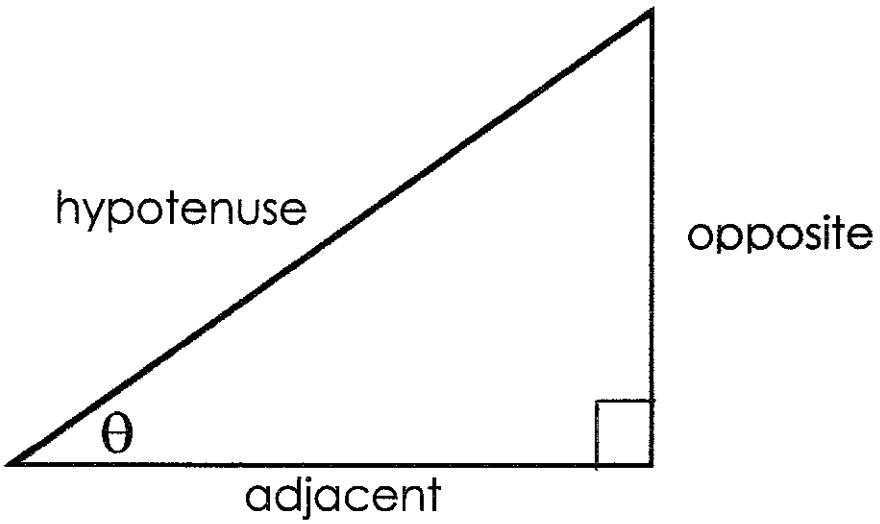


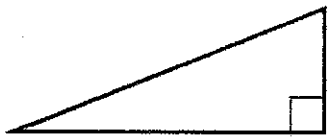
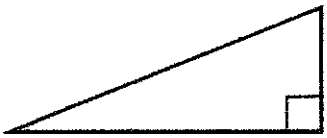
16)



Name: _____ Date: _____

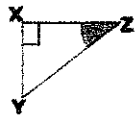
Trigonometry Ratios



Sine	Cosine	Tangent
		
SOH	CAH	TOA
$S = \frac{O}{H}$	$C = \frac{A}{H}$	$T = \frac{O}{A}$

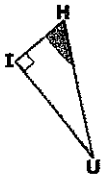
1. Identify the side that is opposite $\angle Z$ _____

2. Identify the side that is adjacent to $\angle Z$ _____



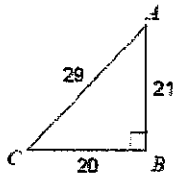
3. Identify the side that is opposite $\angle H$ _____

4. Identify the side that is adjacent to $\angle H$ _____

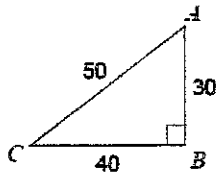


Find the value of each trigonometric ratio. Express your answer as a fraction in lowest terms.

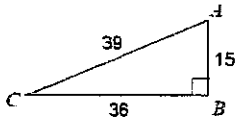
5. sin C =



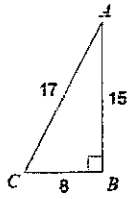
6. sin C =



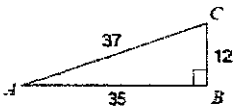
7. cos C =



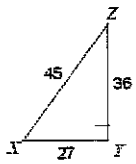
8. cos C =



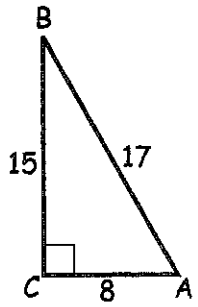
9. tan A =



10. tan X =



For each of the following, find the trigonometric ratio.



11. sin A _____

12. cos A _____

13. tan A _____

14. sin B _____

15. cos B _____

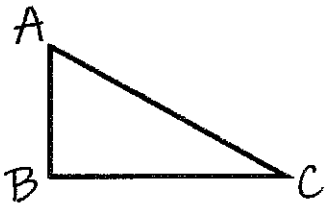
16. tan B _____

How do your answers in #11-13 compare to those in #14-16?

Name: _____ Date: _____

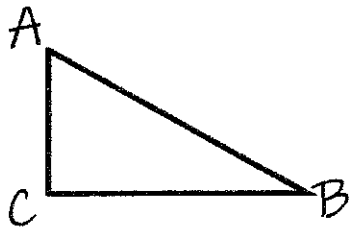
Trigonometry Ratios – Classwork

Draw ΔABC where $\angle ABC = 90°$, $AB = 8$, $BC = 15$, and $AC = 17$.



1. What is tan C?
2. What is sin A?

Draw ΔABC where $\angle ACB = 90°$, $AC = 5$, and $CB = 12$.



3. What is the length of AB?
4. What is cos A?
5. What is tan B?

Draw ΔCAT where $\angle ATC = 90°$, $CA = 53$, and $CT = 28$.

6. What is the length of AT?
7. What is sin C?
8. What is tan A?

Draw ΔABC where $\angle B = 90°$ and $\sin A = \frac{12}{20}$.

9. What is the length of AB?
10. What is tan A?
11. What is cos A?

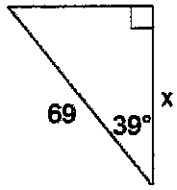
Draw ΔHAT where $\angle H = 90°$ and $\tan T = \frac{12}{35}$.

12. What is the length of AT?
13. What is sin A?
14. What is cos T?

In the following problems, DRAW stick-man standing where the angle is and MARK each given side as A (*adjacent*), O (*opposite*), or H (*hypotenuse*). Then TELL which TRIG RATIO you have.
You will NOT be solving the problem for x (we haven't learned how YET).

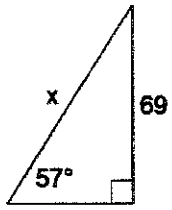
15. Which trig ratio is represented?

A. SIN
B. COS
C. TAN



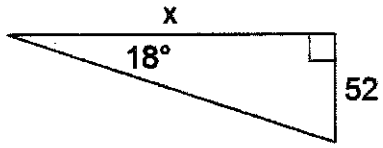
16. Which trig ratio is represented?

A. SIN
B. COS
C. TAN



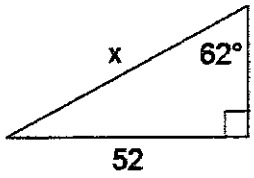
17. Which trig ratio is represented?

A. SIN
B. COS
C. TAN



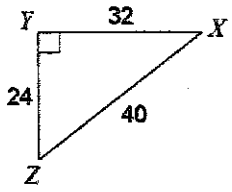
18. Which trig ratio is represented?

A. SIN
B. COS
C. TAN

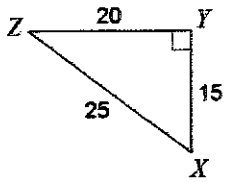


Find each ratio and be sure to reduce, if possible.

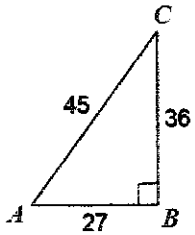
19. Tan Z



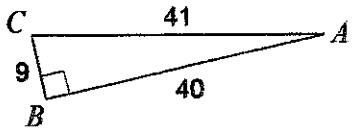
20. Sin X



21. Cos A

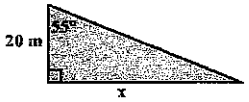


22. Sin C

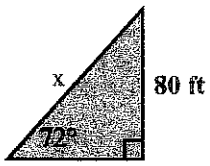


Finding Missing Sides

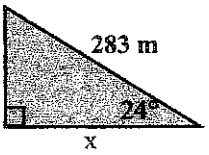
Ex: 1 Figure out which ratio to use. Find x. Round to the nearest tenth.



Ex: 2 Figure out which ratio to use. Find x. Round to the nearest tenth.



Ex: 3 Figure out which ratio to use. Find x. Round to the nearest tenth.



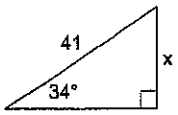
Geometry Name_____ ID: 1

Missing Side Lengths Practice

Date_____ Period____

Find the missing side. Round to the nearest tenth.

1)



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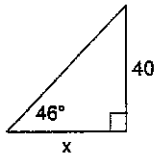

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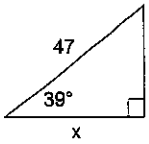

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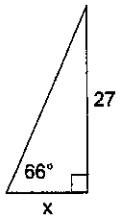

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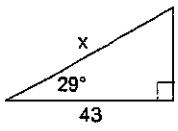

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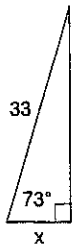

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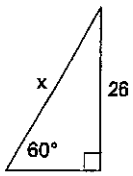

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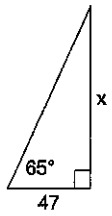

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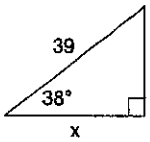

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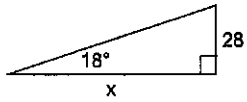

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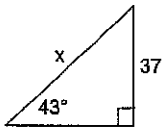

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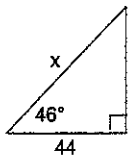

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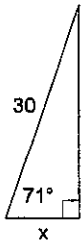

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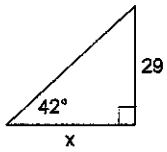
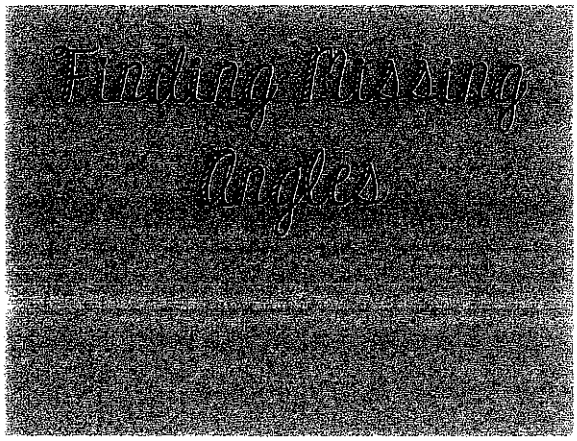
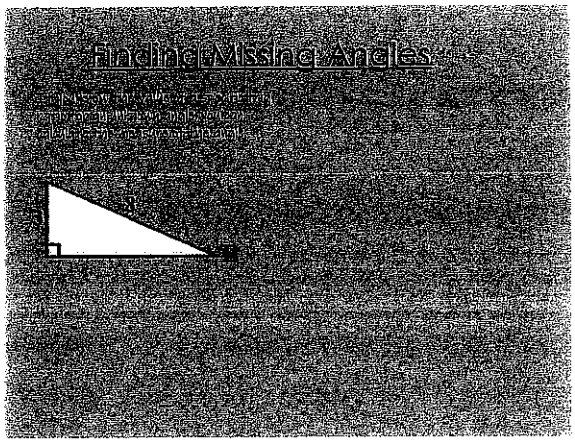
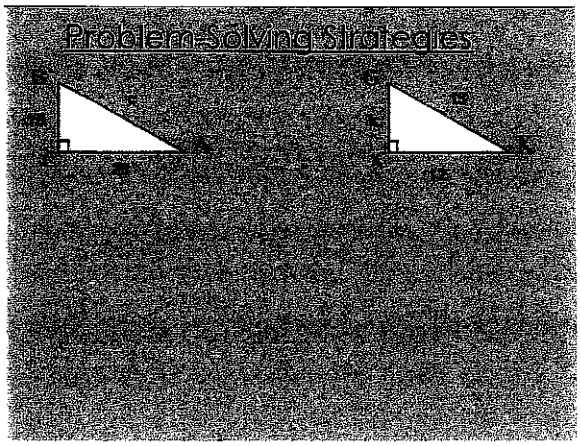
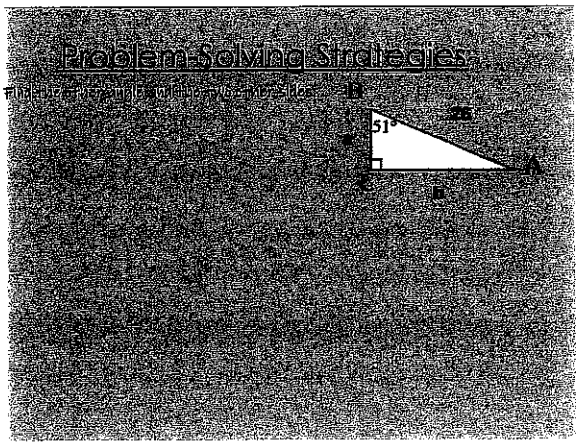


SOH CAH TOA Missing Angles

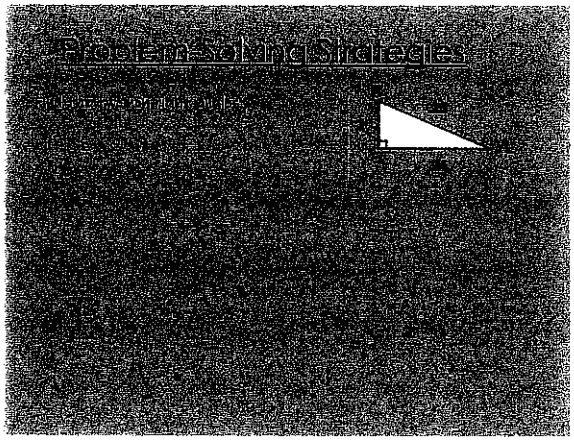








SOH CAH TOA Missing Angles

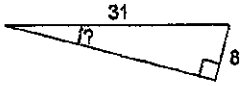


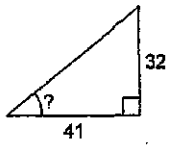
Analytic Geometry Name_____

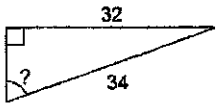
Finding Missing Angles & Sides

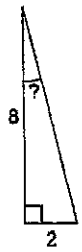
Date_____ Period____

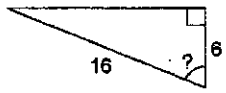
Find the measure of the indicated angle to the nearest degree.

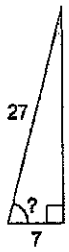
1) 

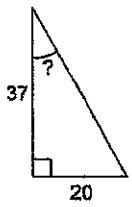
2) 

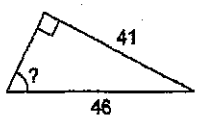
3) 

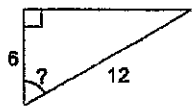
4) 

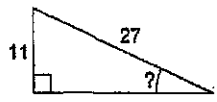
5) 

6) 

7) 

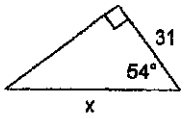
8) 

9) 

10) 

Find the missing side. Round to the nearest tenth.

11)



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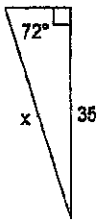

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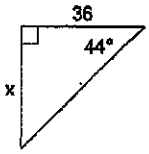

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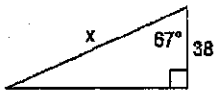

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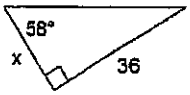

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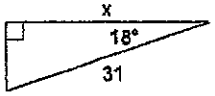

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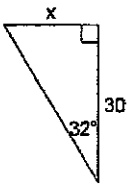

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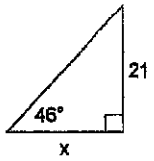

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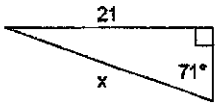

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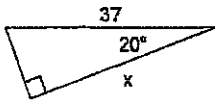
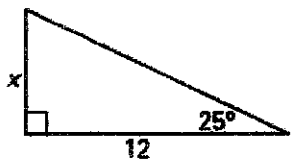
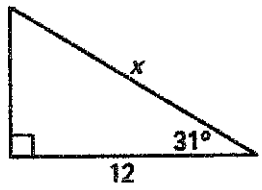
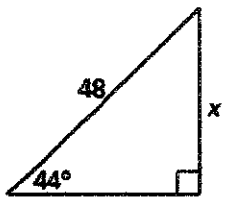


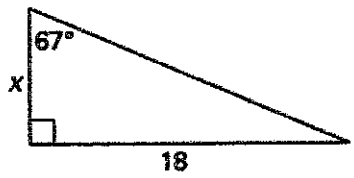
Name: _____ Date: _____

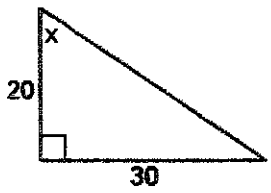
Using Trig Ratios to find Missing Sides or Angles

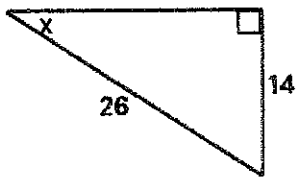
1. 

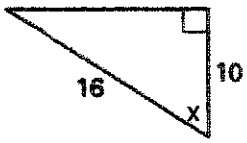
2. 

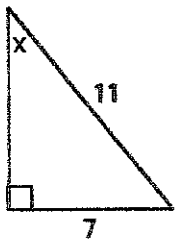
3. 

4. 

5. 

6. 

7. 

8. 

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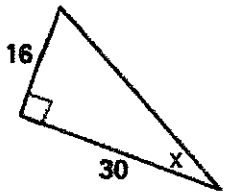

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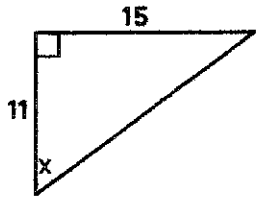

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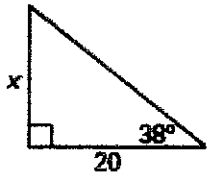

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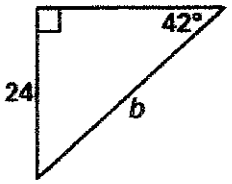

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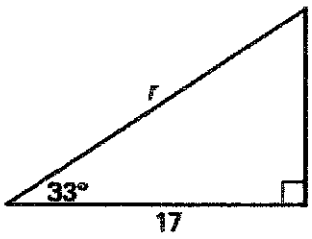

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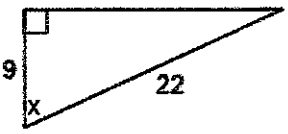
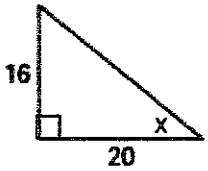
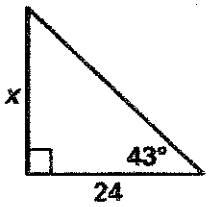


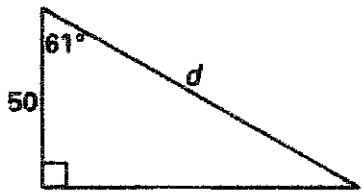
15.



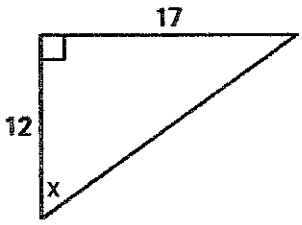
16.



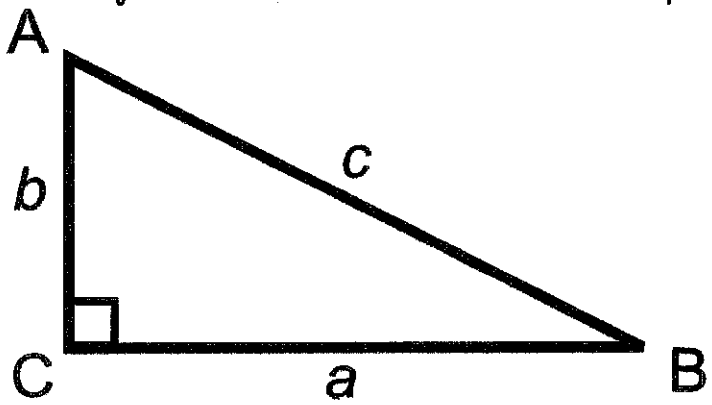
17.



18.



Trig CoFunction Relationships



In the above triangle, Name two complementary angles.

The Sine of an angle is always equal to the _____ of its complement.

So...

Sin(A) = Cos(____)

And Cos(A)= Sin(____)

The Tangents of complementary angles are _____ of each other.

So.. if the Tan(A)=$\frac{3}{5}$ then the Tan(B)=_____

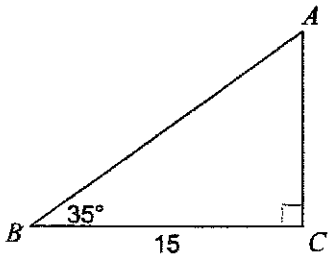
Example: If you are given an Angle: Sin(θ)=Cos(90-θ) Sin(75)=Cos(____)	1. Cos(22) = Sin (_____)
Example: If you are given a ratio. Given: A and B are complementary. And Sin(B)=$\frac{4}{5}$ Find: Sin(A) = _____ Cos(A)=_____ Cos(B) =_____ Tan(A) = _____ Tan (B) = _____	2. Given: A and B are complementary. And Cos(B)=$\frac{8}{17}$ Find: Sin(A)= _____ Cos(A)=_____ Sin(B)= _____ Tan(B)= _____ Tan(A)=_____

Trig Quiz Review

1. Length AC _____

2. Length AB _____

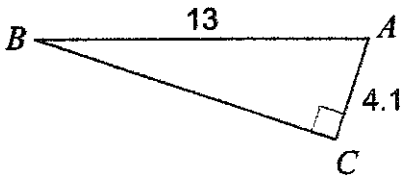
3. $m\angle A$ _____



4. Length of BC _____

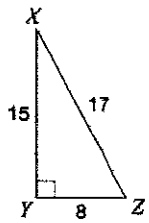
5. $m\angle B$ _____

6. $m\angle A$ _____



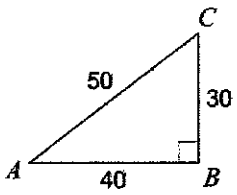
7. Determine the requested ratio.

$\sin Z$

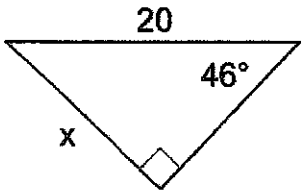


8. Determine the requested ratio.

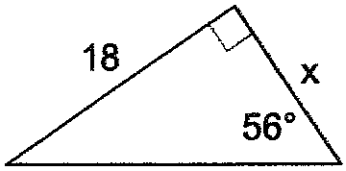
$\tan C$



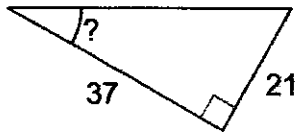
9. Find the missing side. Round to the nearest 10th



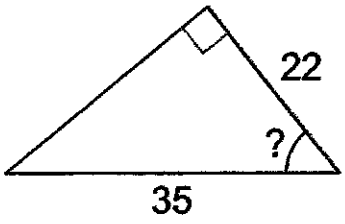
10. Find the missing side. Round to the nearest 10th.



11. Find the requested angle. Round to the nearest whole number.

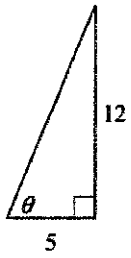


12. Find the requested angle. Round to the nearest whole number.



13. Sin (θ)= _____

14. Cos(90-θ)=_____



15. Sin(52) = Cos(_____)

16. Cos(32) = Sin (_____)

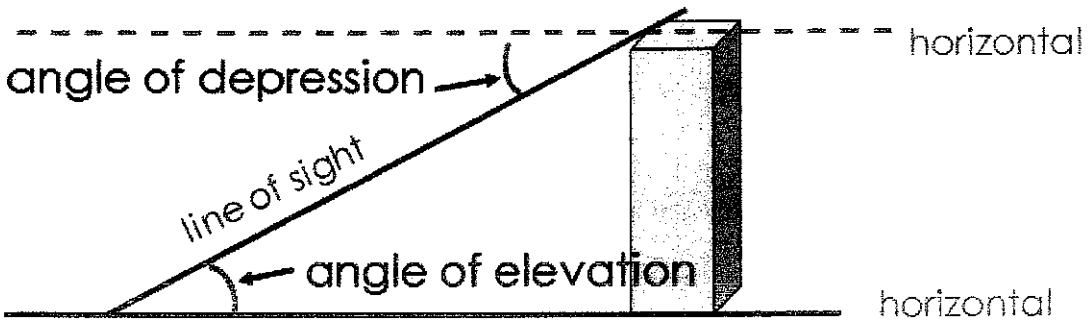
17. If Tan(θ) = $\frac{8}{15}$ then

Tan(90-θ) = _____

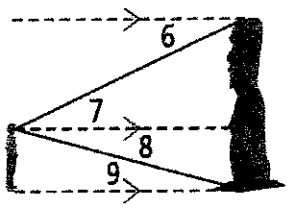
Name: _____ Date: _____

Trig Application Problems

Angle of Elevation & Angle of Depression



1. Classify each angle as an angle of elevation or angle of depression:



2. Over 2 miles (horizontal), a road rises 300 feet (vertical). What is the angle of elevation to the nearest degree?

3. The angle of depression from the top of a tower to a boulder on the ground is 38°. If the tower is 25 meters high, how far from the base of the tower is the boulder? Round to the nearest whole number.

4. Find the angle of elevation to the top of a tree for an observer who is 31.4 meters from the tree if the observer's eye is 1.8 meters above the ground and the tree is 23.2 meters tall. Round to the nearest degree.

5. A 75 foot building casts an 82 foot shadow. What is the angle that the sun hits the building? Round to the nearest degree.

6. A boat is sailing and spots a shipwreck 650 feet below the water. A diver jumps from the boat and swims 935 feet to reach the wreck. What is the angle of depression from the boat to the shipwreck, to the nearest degree?

---

7. A 5 ft tall bird watcher is standing 50 feet from the base of a large tree. The person measures the angle of elevation to a bird on top of a tree as 71.5°. How tall is the tree? Round to the nearest tenth.

---

8. A block slides down a 45° slope for a total of 2.8 meters. What is the change in the height of the block? Round to the nearest tenth.

---

9. A projectile has an initial horizontal velocity of 5 meters per second and an initial vertical velocity of 3 meters per second upwards. At what angle was the projectile fired, to the nearest degree?

---

10. A construction worker leans his ladder against a building making a 60° angle with the ground. If his ladder is 20 feet long, how far away is the base of the ladder from the building to the nearest tenth?

Trig Applications

1. A ladder is leaning against the side of a house and forms a 65° angle with the ground. The foot of the ladder is 8 feet from the house. Find the length of the ladder.

2. A lighthouse built at sea level is 150 feet high. From its top, the angle of depression of a buoy is 25°. Find the distance from the buoy to the foot of the lighthouse.

3. A surveyor is 100 meters from a bridge. The angle of elevation to the top of the bridge is 35°. The surveyor's instrument is 1.45 meters above the ground. Find the height of the bridge.

4. A surveyor is 100 meters from a building. The angle of elevation to the top of the building is 23°. The surveyor's instrument is 1.55 meters above the ground. Find the height of the building.

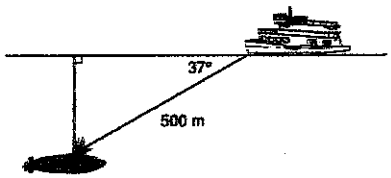
5. In a parking garage, each level is 20 feet apart. Each ramp to a level is 130 feet long. Find the measure of elevation for each ramp.

6. A train in the mountains rises 10 feet for every 250 feet it moves along the track. Find the angle of elevation of the track.

7. A plane rose from take-off and flew at an angle of 11° with the ground. When it reached an altitude of 500 feet, what was the horizontal distance the plane had flown?

8. As viewed from a cliff 360 m above sea level, the angle of depression of a ship is 28°. How far is the ship from the shore?

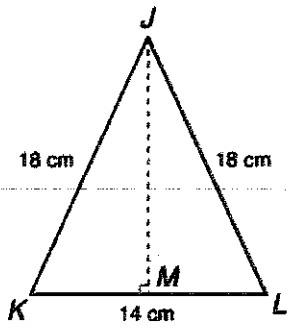
9. A sonar operator on a cruiser detects a submarine at a distance of 500 m and an angle of depression of 37°. How deep is the submarine?



10. The legs of an isosceles triangle are each 18 cm. The base is 14 cm.

Find: a) the measure of the base angles,

and b) the exact length of the altitude to the base.

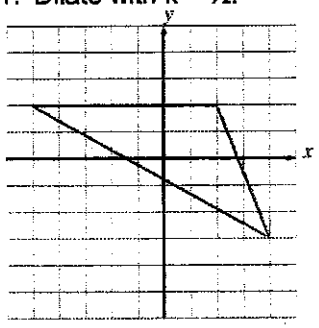
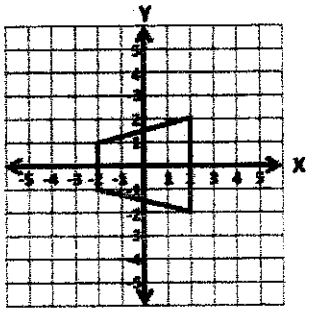
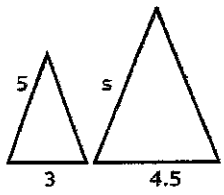
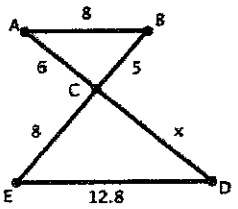
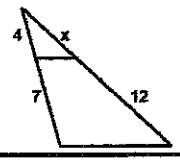
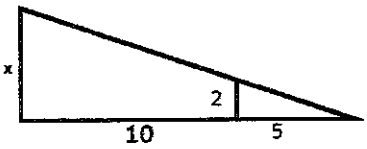
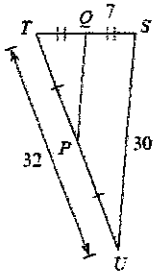
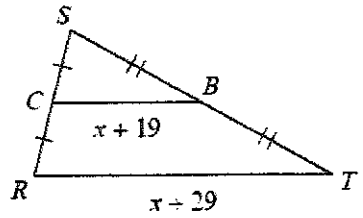
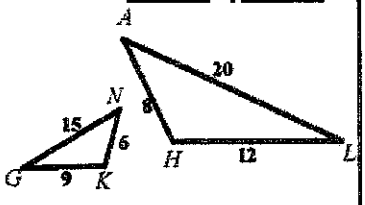
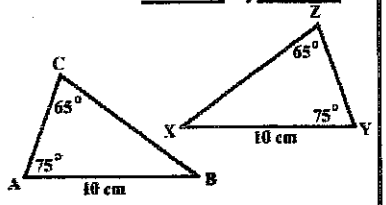


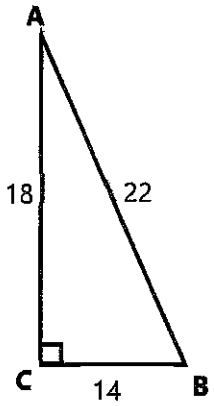
11. The sides of an equilateral triangle are all 10 inches. Find the height.

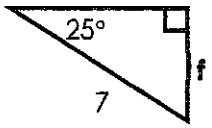
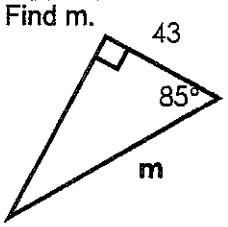
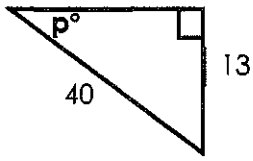
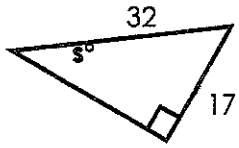
12. The sides of a square are all 10 inches. Find the length of the diagonal.

Name: _____ Date: _____

Use the following to review for you test. Work the Practice Problems on a separate sheet of paper.

What you need to know & be able to do	Things to remember		
A. Perform a dilation with a given scale factor	When the center of dilation is the origin, you can multiply each coordinate of the original figure, or pre- image, by the scale factor to find the coordinates of the dilated figure, or image.	1. Dilate with k = ½. 	2. Dilate with k = 2. 
B. Find the missing side for similar figures.	Set up a proportion by matching up the corresponding sides. Then, solve for x.	3. 	4. 
		5. 	6. 
C. Midsegment Theorem	The segment connecting the midpoints of two sides of the triangle is parallel to the third side and 1/2 the length of the third side.	5. Find PQ and TP 	6. Solve for x. 
D. Determine if 2 triangles are similar, and write the similarity statement.	Remember the 3 ways that you can do this: AA, SAS, SSS	7. ΔGNK ~ _____ by_____ 	8. ΔABC ~ _____ by_____ 

<table>
<tr><td rowspan="4">E. Find sin, cos, and tan ratios</td><td rowspan="4">Just find the fraction using SOHCAHTOA</td><td rowspan="4"> 
</td><td>9. Find sin A.</td></tr>
<tr><td>10. Find tan B.</td></tr>
<tr><td>11. Find cos B.</td></tr>
<tr><td>12. Find tan A.</td></tr>
<tr><td>F. Know the relationship between the ratios for complementary angles.</td><td>$\sin\theta = \cos(90-\theta)$
$\cos\theta = \sin(90-\theta)$
$\tan\theta = \frac{1}{\tan(90-\theta)}$</td><td colspan="2">13. Given Right ΔABC and $\sin\theta = 5/13$, find $\sin(90-\theta)$ and $\cos(90-\theta)$.</td></tr>
<tr><td>G. Use trig to find a missing side measure</td><td>Set up the ratio and then use your calculator.

If the variable is on the top, multiply.
If the variable is on the bottom, divide.</td><td>14. Find f.
 
</td><td>15. Find m.
 
</td></tr>
<tr><td>H. Use trig to find a missing angle measure</td><td>Tap the trig button twice to get the INVERSE then type in the ratio.</td><td>16. Find p.
 
</td><td>17. Find s.
 
</td></tr>
<tr><td>I. Trig Word Problems</td><td>Draw the picture.
Label the sides.
Set up the ratio, and solve.</td><td colspan="2">18. From 25 feet away from the base of a building, the angle of elevation from the ground to the top of a building is measured to be 38°. How tall is the building?

19. A kite is 35 feet in the air and the string forms an angle of 62° with the ground. How long is the string?</td></tr>
</table>

Name: _____ Date: _____

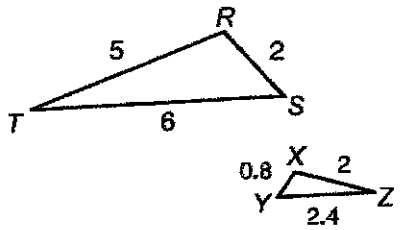
Unit 2 Test Review

Similar Triangles:

1) In the figure, ΔRST ~ ΔXYZ.

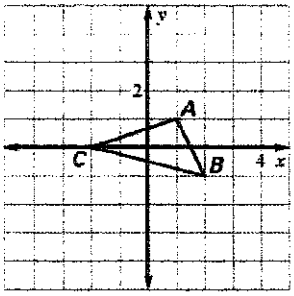
a) Find the scale factor of ΔRST to ΔXYZ.

b) Find the perimeter of both triangles. What is the ratio of the perimeters of the 2 triangles?

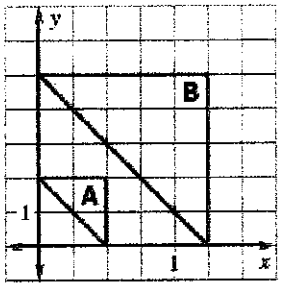


2) Dilations:

a) Draw a dilation with k = 2

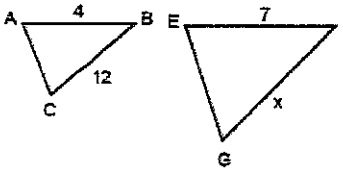


b) Determine the scale factor, k = ____

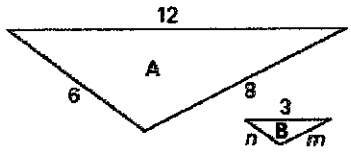


3) Find the length of the missing side(s).

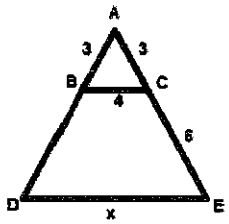
a)



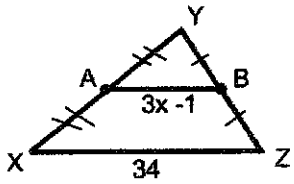
b)



c)

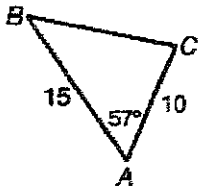


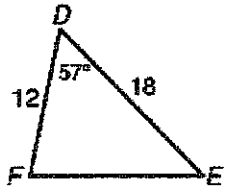
d)



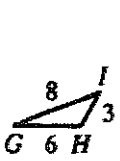
4) Determine if the following triangles are similar. If so, give the postulate and similarity statement.

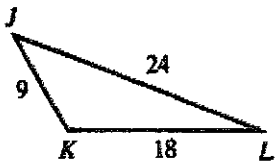
a) ΔABC ~ _____ by_____



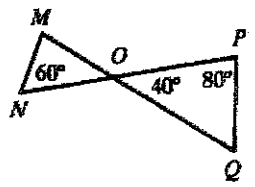


b) ΔGHI ~ _____ by_____





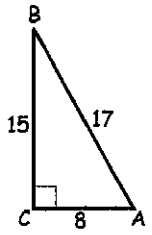
c) ΔMNO ~ _____ by_____



5) If a 42.9 ft tall flagpole casts a 253.1 ft long shadow, then how long is the shadow that a 6.2 ft. tall woman casts?

SOHCAHTOA:

6) a) Find the 3 trig ratios from Angle A and Angle B.



b) How do the ratios compare for the two angles?

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7) **Draw ΔCAT where ∠ATC = 90°, CA = 53, and CT = 28.**

a) What is the length of AT?

b) What is sin C? c) What is tan A?

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8) **Draw ΔABC where ∠B = 90° and sin A = $\frac{12}{20}$.**

a) What is the length of AB?

b) What is tan A? c) What is cos A?

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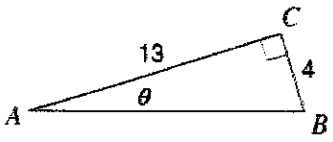
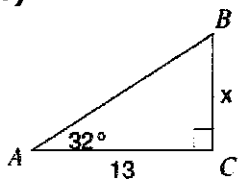
9) Solve for the missing side or angle using Trig Ratios (sin, cos, tan).

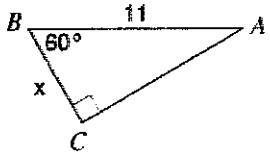
a)



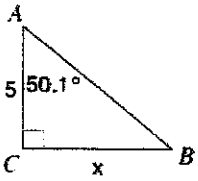
b)



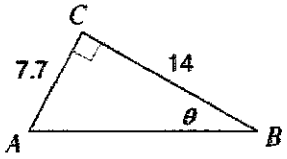
c)



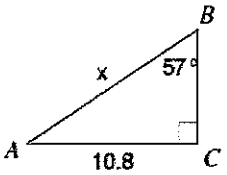
d)



e)



f)



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10) An 8 foot ladder is leaning against a wall so that the base is 5 feet from the base of the wall. What angle does the ladder make with the ground? Round to the nearest tenth.

11) A surveyor is standing 25 ft from a building and is looking at the top with an angle of elevation of 65°. If his eye height is 6 ft, how tall is the building? Round to the nearest tenth.

12) A kite is being flown using 150 yards of string. The kite has an angle of elevation with the ground of 65 degrees. How high above the ground is the kite?