Review: Similarity and Trig

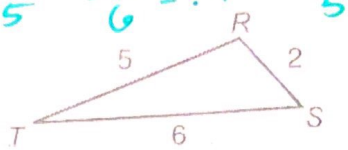
Name: _____ Date: _____

Unit 3

Similar Triangles:

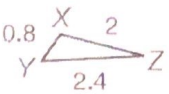
1) In the figure, $\Delta RST \sim \Delta XYZ$.
   a) Find the scale factor of ΔRST to ΔXYZ.

orig. new $\frac{.8}{2} = .4 = \frac{2}{5}$ $\frac{2.4}{6} = .4$ $\frac{2}{5}$

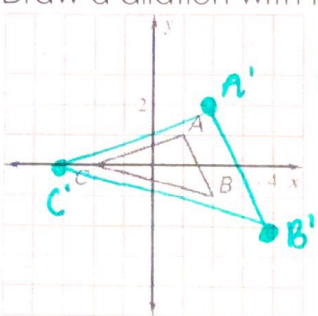


   b) Find the perimeter of both triangles. What is the ratio of the perimeters of the 2 triangles?

$\Delta RST = 13$ $\Delta XYZ = 5.2$ $\frac{5.2}{13} = .4$

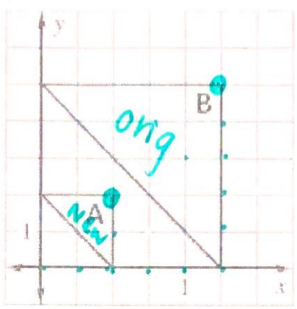


2) Dilations:
   a) Draw a dilation with k = 2



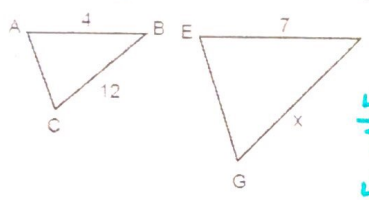
A(1,1) → 2,2
B(2,-1) → (4,-2)
C(-2,0) → (-4,0

   b) Determine the scale factor, k = .4



(5,5)
(2,2)

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

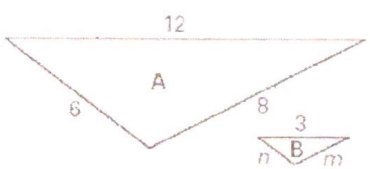


$\frac{4}{7} = \frac{12}{x}$

$4x = 84$

$x = 21$

   b)



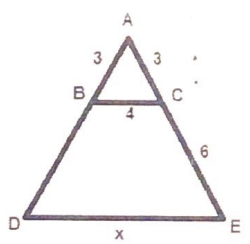
$\frac{12}{3} = 4$

$\frac{6}{x} = 4$

$6 = 4x$

$x = \frac{6}{4} = 1.5$

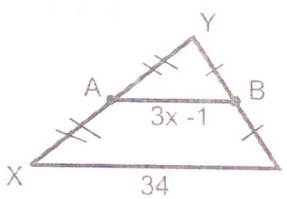
   c)



$\frac{3}{9} = \frac{4}{x}$

$x = 12$

   d)



$2(3x-1) = 34$

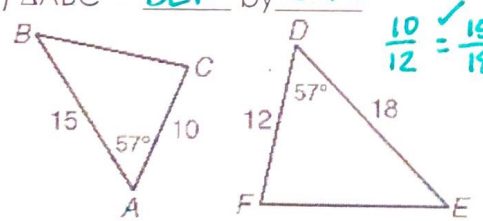
$6x - 2 = 34$

$36x = 36$

$x = 6$

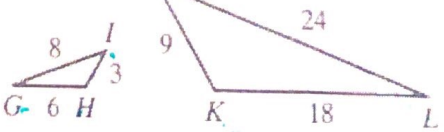
4) Determine if the following triangles are similar. If so, give the postulate and similarity statement.

a) $\Delta ABC \sim$ DEF by SAS



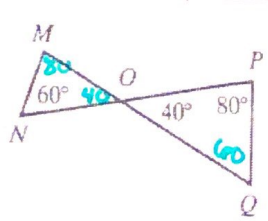
$\frac{10}{12} = \frac{15}{18}$ ✓

b) $\Delta GHI \sim$ LKJ by SSS



$\frac{24}{8} = \frac{18}{6} = \frac{9}{3}$

c) $\Delta MNO \sim$ PQO by AA



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?

$\frac{42.9}{6.2} = \frac{253.1}{x}$

42.9 | 253.1 6.2 | x

$1569.22 = 42.9x$

$x = 36.58$

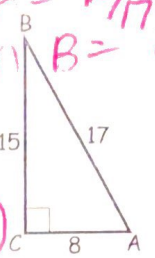
Review: Similarity and Trig

SOHCAHTOA:

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

$\sin(A) = \frac{15}{17}$ $\cos(A) = \frac{8}{17}$ $\tan(A) = \frac{15}{8}$

$\sin(B) = \frac{8}{17}$ $\cos(B) = \frac{15}{17}$ $\tan(B) = \frac{8}{15}$



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

$\sin(A) = \cos(B)$ $\cos(A) = \sin(B)$ $\tan A = \frac{1}{\tan(B)}$

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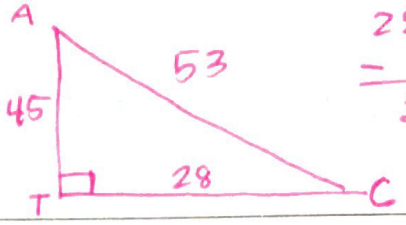
7) **Draw ΔCAT where $\angle ATC = 90°$, CA = 53, and CT = 28.**

a) What is the length of AT? 45

b) What is sin C? $\frac{45}{53}$ c) What is tan A? $\frac{28}{45}$



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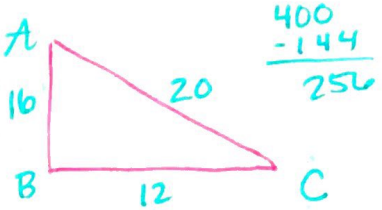
8) **Draw ΔABC where $\angle B = 90°$ and $\sin A = \frac{12}{20}$.**

a) What is the length of AB? 16

b) What is tan A? $\frac{12}{16} = \frac{3}{4}$ c) What is cos A? $\frac{16}{20} = \frac{4}{5}$



$400 - 144 = 256$

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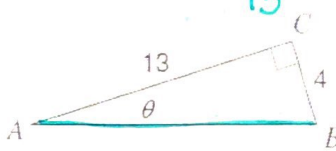
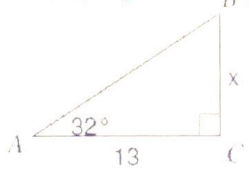
9) Solve for the missing side or angle using Trig Ratios (sin, cos, tan).

a) $\tan(\theta) = \frac{4}{13}$



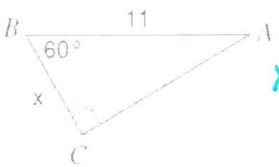
$\theta = 17.1$

b) $\tan(32) = \frac{x}{13}$



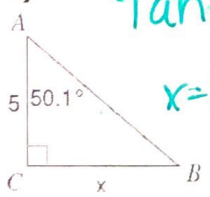
$x = 8.1$

c) $\cos(60) = \frac{x}{11}$



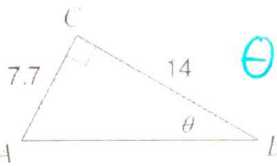
$x = 5.5$

d) $\tan(50.1) = \frac{x}{5}$



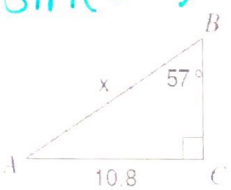
$x = 5.98$

e) $\tan^{-1}\left(\frac{7.7}{14}\right) = \theta$



$\theta = 28.8$

f) $\sin(57) = \frac{10.8}{x}$



$x = 12.9$

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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.

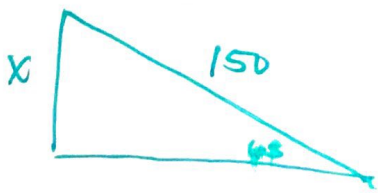
$\cos^{-1}(5/8) = \theta$ $\theta = 51.32$

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.

$\tan(65) = \frac{x}{25}$ $+6$

$53.61 + 6 = 59.61$

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?



$\sin(65) = x/150$

$135.94 = x$

Name: [Answers Only] work must be shown for HW credit. Date: _____

1. A ramp to a building has a height of 4 feet and the angle of elevation is 33°. How long is the ramp?

$x = 7.34$

2. An equilateral triangle has a side length of 13 feet. Find the height of the triangle.

$x = 11.26$ or $\frac{13\sqrt{3}}{2}$

3. If a kite is 40 feet off the ground and the string holding the kite is 42 feet long, what is the angle of elevation to the kite?

$x = 72.23$

4. A 15 foot ladder is leaned against a house. If the base of the ladder is 4 feet from the house, what angle does the ladder make with the ground?

$x = 74.53$

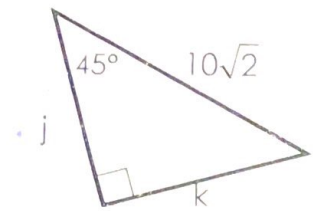
5. In a large theater, the stairs have an angle of elevation of 27°. If the theater is 50 feet long, how tall is the highest seat?

$x = 25.47$

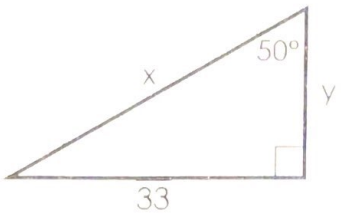
6. The area of a square is 16 in^2. Find the length of the diagonal.

$x = 4\sqrt{2}$

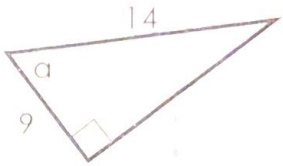
1. $j =$ 10, $k =$ 10



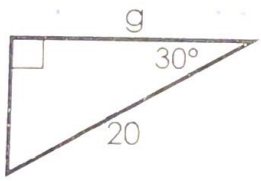
2. $x =$ 43.08, $y =$ 27.69



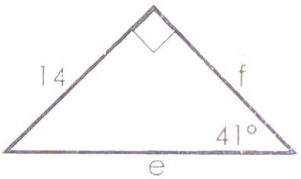
3. $a =$ 50



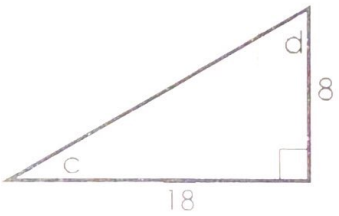
4. $g =$ $10\sqrt{3}$



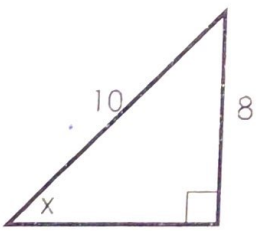
5. $e =$ 21.34, $f =$ 16.11



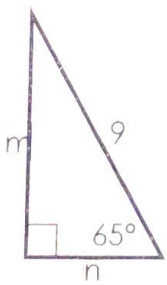
6. $c =$ 23.96, $d =$ 66.04



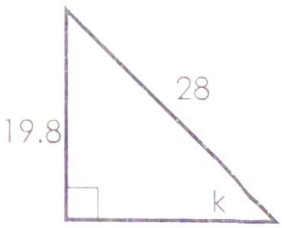
7. $x =$ 53.13



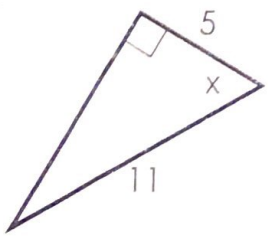
8. $m =$ 8.16, $n =$ 3.80



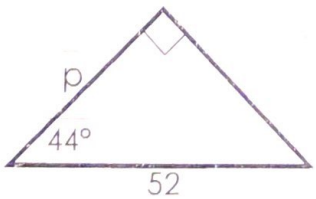
9. $k =$ 45



10. $x =$ 62.96



11. $p =$ 37.41



12. $a =$ 65 $b =$ 13.94