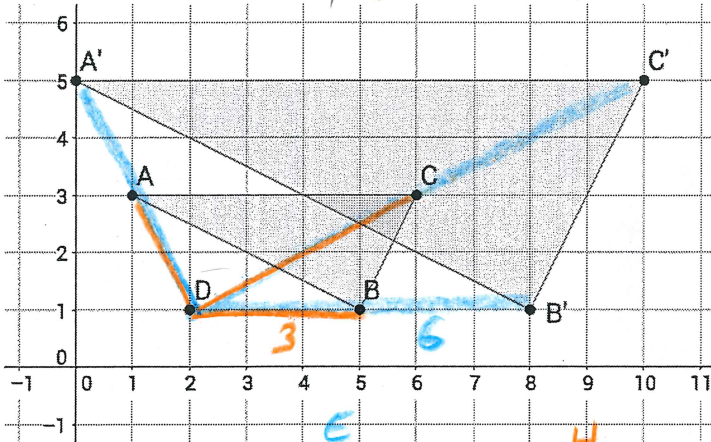
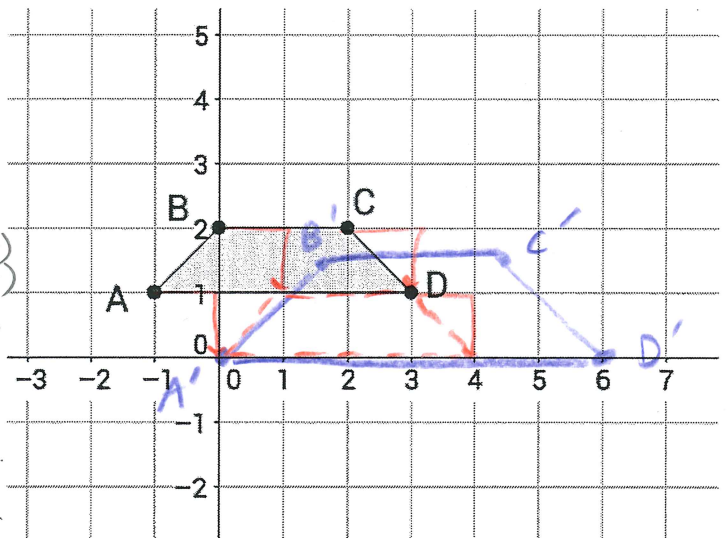


# Similarity and Trig Unit Review

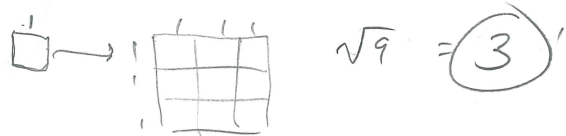
## SRT-1: Dilation, Similar Figures, Triangle Sim.

1. Isosceles trapezoid ABCD is translated by rule  $(x, y) \rightarrow (x + 1, y - 1)$ . It then right 1 Down 1 undergoes a dilation centered at the origin with scale factor 1.5. Draw the resulting image.   
*Multiply coordinates by 1.5*  
 $(0, 1) \rightarrow (0, 1.5)$   
 $(1, 1) \rightarrow (1.5, 1.5)$   
 $(3, 1) \rightarrow (4.5, 1.5)$
2.  $\triangle ABC$  is dilated about point D to create  $\triangle A'B'C'$ . Determine the scale factor of dilation.   
 $\frac{6}{3} = 2$

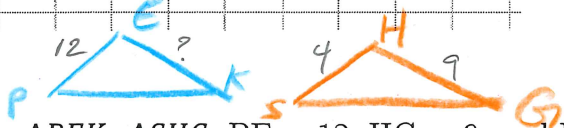
## Practice Assessment



3. A rectangle is dilated using graphics software such that its area is 9 times the original. What was the scale factor of dilation?



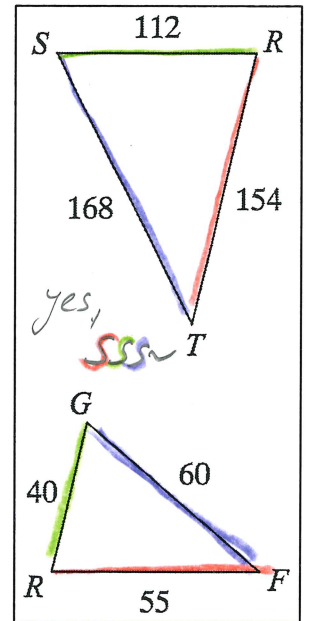
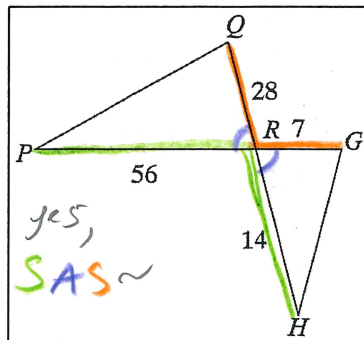
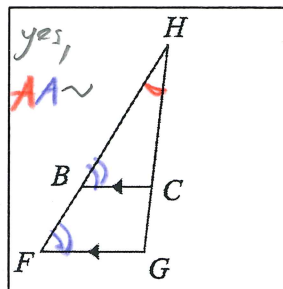
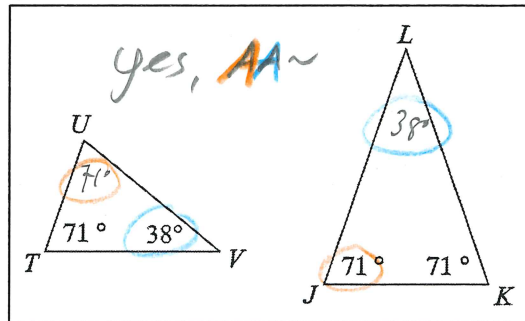
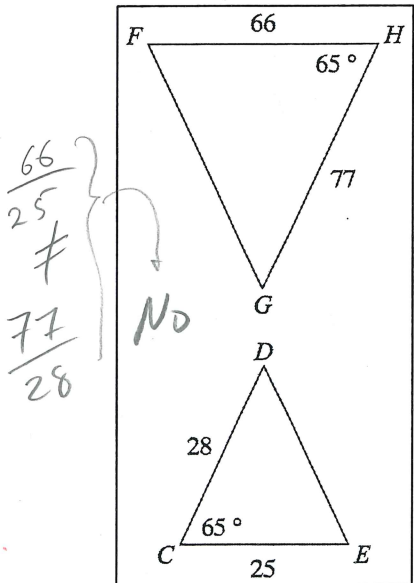
4. Given  $\triangle PKE \sim \triangle SHG$ ,  $PE = 12$ ,  $HG = 9$ , and  $HS = 4$ . What is the length of  $KE$ ?



order matters!

$12 \rightarrow 4$  scale is  $\frac{1}{3}$   
 $? \rightarrow 9$  so  $9 / \frac{1}{3} = 27$   
 $\frac{12}{4} = \frac{x}{9}$

5. Are the triangles in each pair similar? If so, what criteria allow you to know?



options for similarity: AA~

SAS~ SSS~

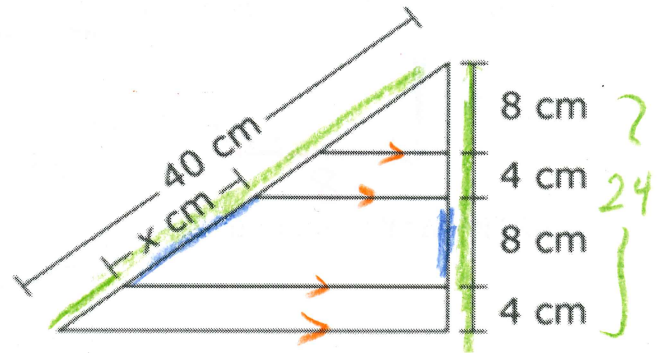
**SRT-2:** Triangle Proportions, Applying Similarity, Pythagorean Theorem

6. The 3 line segments spanning the triangle are parallel to the base. Find the value of  $x$  to the nearest hundredth.

$$\frac{x}{40} = \frac{8}{24}$$

$$24x = 320$$

$$x = 13.33$$



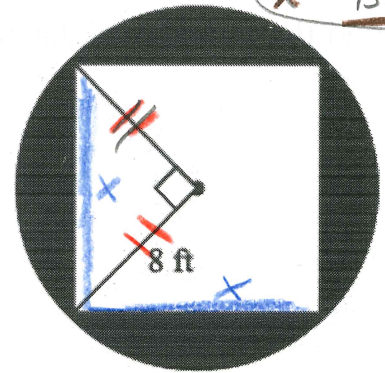
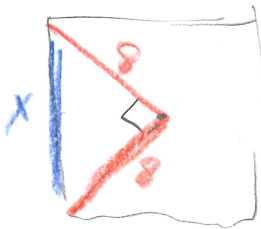
7. A 5'3" woman is standing 12'6" from the base of a lamp post. Her shadow is 8 feet long. To the nearest hundredth of a foot, how tall is the lamp post?

$5 \frac{3}{12} \text{ ft}$        $12 \frac{6}{12} \text{ ft}$   
 $5.25 \text{ ft}$        $12.5 \text{ ft}$

$\Delta A \sim \Delta B$   
 $\frac{8}{5.25} = \frac{20.5}{x}$   
 $8x = 107.625$   
 $x = 13.45'$

8. A square is inscribed in a circle of radius 4. Find the area of the square.

$r = 4$

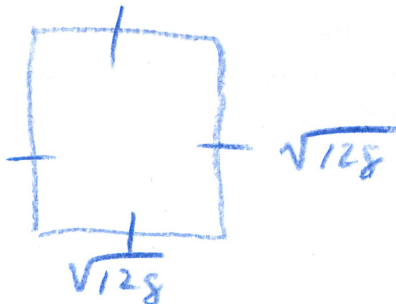


$$8^2 + 8^2 = x^2$$

$$64 + 64 = x^2$$

$$\sqrt{128} = \sqrt{x^2}$$

$$\sqrt{128} = x$$



$$A = b \cdot h$$

$$= \sqrt{128} \cdot \sqrt{128}$$

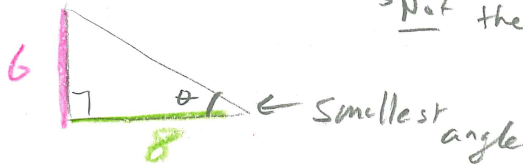
$$= 128$$

SRT-3: Trigonometry

SOHCAHTOA

9. A right triangle has legs of length 6 and 8. Find the cosine of the smallest angle.

Not the hypotenuse!



$$\cos \theta = \frac{\text{adj.}}{\text{hyp.}} = \frac{8}{???} \leftarrow \text{Pythag!}$$

$$6^2 + 8^2 = c^2 \rightarrow c = 10$$

PRO-TIP  
Smallest angle is directly opposite the smallest side!

10.  $\triangle RTW \sim \triangle XYZ$ . Find  $\tan Z$ .

$$\tan Z = \frac{\text{opp.}}{\text{adj.}} = \frac{7}{?}$$

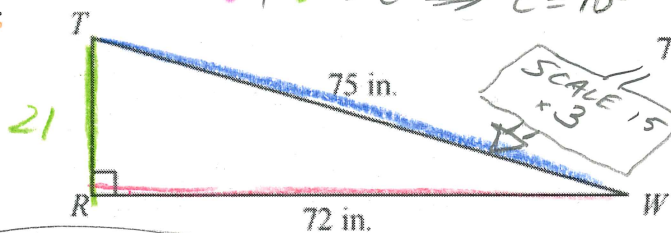
Similar! so...

$$\frac{25}{75} \times \frac{?}{72}$$

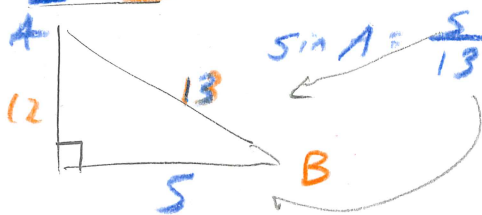
$$1800 = 75x$$

$$24 = x$$

$$\tan Z = \frac{7}{24}$$



11. A and B are complementary angles.  $\sin A = \frac{5}{13}$  and  $\sin B = \frac{12}{13}$ . Find  $\tan B$ .



$$\sin A = \frac{5}{13} \leftarrow \text{opp.} / \text{hyp.}$$

$$\sin B = \frac{12}{13} \leftarrow \text{opp.} / \text{hyp.}$$

$$\tan B = \frac{\text{opp.}}{\text{adj.}} = \frac{12}{5}$$

12. Find the perimeter of this triangle to the nearest tenth.

$$\tan 34 = \frac{6.1}{x}$$

$$0.675 = \frac{6.1}{x}$$

$$0.675x = 6.1$$

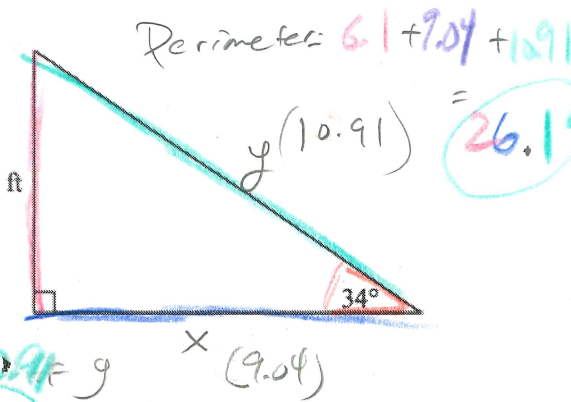
$$x = 9.04$$

$$\sin 34 = \frac{6.1}{y}$$

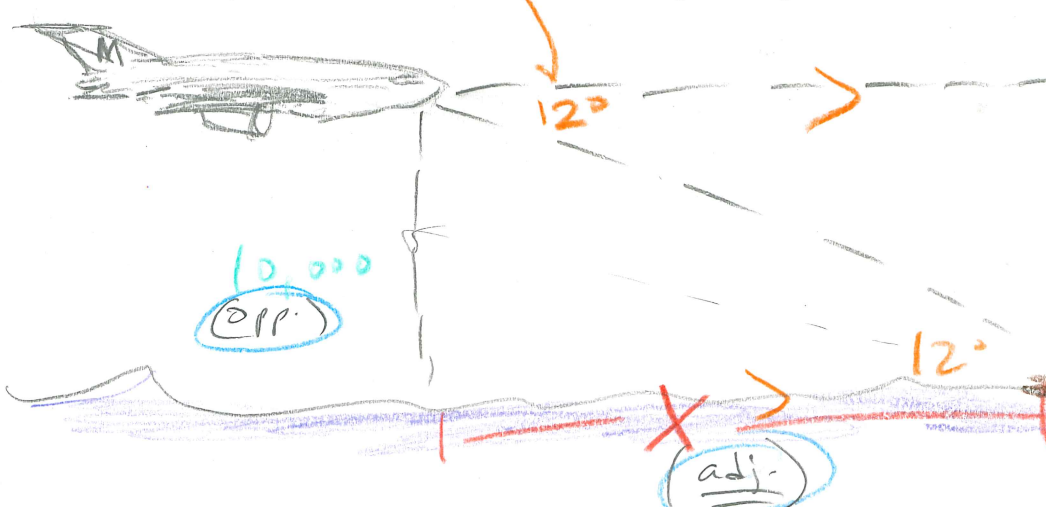
$$0.559 = \frac{6.1}{y}$$

$$6.1 = 0.559y$$

$$y = 10.91$$



13. A pilot flying an airplane at an altitude of 10,000 feet above sea level spots an unfamiliar island in the distance below. The angle of depression down to the island is  $12^\circ$ . When measured along the sea to the nearest foot, how far is the island from the plane's position?



$$\tan 12 = \frac{10,000}{x}$$

$$0.213 = \frac{10,000}{x}$$

$$0.213x = 10,000$$

$$x = 46,948'$$