

Directions: Show all work to support your answer. This includes setting up equations.

1. The measure of the acute angles of a right triangle are in the ratio 5:7. Find the measure of the smallest angle.



$$5x + 7x = 90$$

$$12x = 90$$

$$x = \frac{90}{12} = \frac{15}{2}$$

Smallest  $\angle$

$$5\left(\frac{15}{2}\right) = \frac{75}{2} = 37\frac{1}{2}$$

OK

$$7x = 7\left(\frac{15}{2}\right) = \frac{105}{2} = 52\frac{1}{2}$$

$$52\frac{1}{2} + 37\frac{1}{2} = 90^\circ \checkmark$$

2. Tell whether the two polygons are always, sometimes or never similar.

a. Two squares Always (All  $\triangleq$ .)

b. Two rectangles Sometimes

$1 \begin{array}{|c|c|} \hline 4 & 7 \\ \hline \end{array}$

$2 \begin{array}{|c|c|} \hline 8 & 11 \\ \hline \end{array}$

}

NOT SIMILAR

 $1 \begin{array}{|c|c|} \hline 4 & 10 \\ \hline \end{array}$   
 $2 \begin{array}{|c|c|} \hline 4 & 10 \\ \hline \end{array}$

c. A right triangle and an acute triangle Never  
 By definition: an acute  $\triangle$  - each  $\angle$  is less than  $90^\circ$ .  
 a right  $\triangle$  - there is a right  $\angle$  which is exactly  $90^\circ$ .

3. For the figure show, it is given that  $\frac{KR}{RT} = \frac{KS}{SU}$ . Solve for the missing segment length.  
 KT = 12, KS = 10, SU = 5

Find RT

$$\frac{10}{5} = \frac{(12-x)}{x}$$

$$10x = 60 - 5x$$

$$15x = 60$$

$$x = 4$$

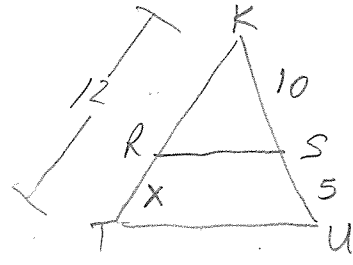
RT = 4

OR

$$\frac{x}{12} = \frac{5}{15}$$

$$15x = 60$$

$$x = 4$$



4. Solve for x.

$$\frac{x(x+5)}{4x+4} = \frac{9}{5}$$

$$5x(x+5) = 9(4x+4)$$

$$5x^2 + 25x = 36x + 36$$

$$5x^2 - 11x - 36 = 0$$

$$(5x+9)(x-4) = 0$$

$$\begin{array}{l|l} 5x+9=0 & x-4=0 \\ \hline x = -\frac{9}{5} & x=4 \end{array}$$

$$\frac{4(9)}{20} = \frac{9}{5}$$

$$\frac{-\frac{9}{5}(-\frac{9}{5}+5)}{4(-\frac{9}{5})+4} \rightarrow \frac{\frac{81}{25} - \frac{225}{5}}{-\frac{36}{5} + \frac{20}{5}} \rightarrow \frac{-\frac{144}{25}}{-\frac{16}{5}} \rightarrow \frac{144}{25} \cdot \frac{5}{16} = \frac{9}{5}$$

5. Which equation is not equivalent to the proportion  $\frac{30-x}{x} = \frac{8}{7}$

a.  $7x = 8(30-x)$

NOT

b.  $8x = 210 - x$

NOT

$\rightarrow 7x = 240 - 8x$

c.  $\frac{x}{30-x} = \frac{7}{8}$

Equivalent  
- Flip of both ratios

$$\frac{30-x}{x} = \frac{8}{7}$$

$$8x = 7(30-x)$$

$$8x = 210 - 7x$$