

Wednesday, January 30, 2013 - Day 1

AIM

SWBAT determine if two triangles are similar and use knowledge of similar triangles to solve word problems.

DO NOW

Top of Notes Sheet

HW QUIZ signed.

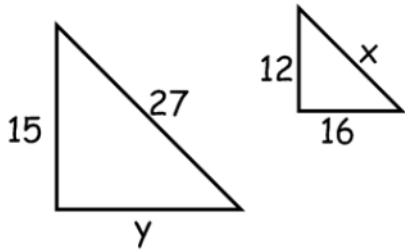
Worksheet - Similar Triangles Word Problems

Triangle Test - Friday

Cumulative Test - Wednesday

Homework: Solving for missing sides of similar triangles, SHOW ALL WORK!!!

1) Solve for x and y.



2) Solve for m and n.

Handwritten work for problem 2:

$$\frac{40}{10} = \frac{m}{6}$$

$$240 = 10m$$

$$\frac{240}{10} = \frac{10m}{10}$$

$$24 = m$$

$$\frac{m}{32} = \frac{6}{8}$$

$$\frac{8m}{8} = \frac{192}{8}$$

$$m = 24$$

3) Solve for x and find the missing side.

Handwritten work for problem 3:

$$\frac{2x+2}{4x+2} = \frac{6}{9}$$

$$9(2x+2) = 6(4x+2)$$

$$18x+18 = 24x+12$$

$$6 = 18x - 18x = 24x - 18x$$

$$6 = 6x$$

$$x = 1$$

4) Solve for x and find the missing side.

Handwritten work for problem 4:

$$\frac{9}{12} = \frac{2x+1}{3x-1}$$

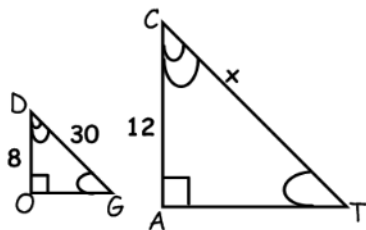
$$9(3x-1) = 12(2x+1)$$

$$27x-9 = 24x+12$$

$$3x = 21$$

$$x = 7$$

5) Solve for x:



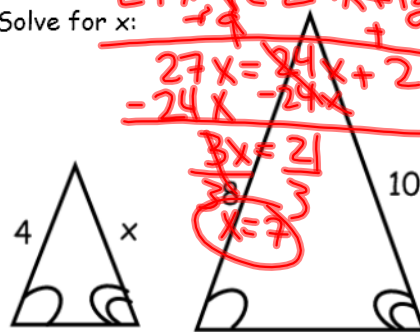
Handwritten work for problem 5:

$$\frac{12}{x} = \frac{8}{30}$$

$$360 = 8x$$

$$45 = x$$

6) Solve for x:



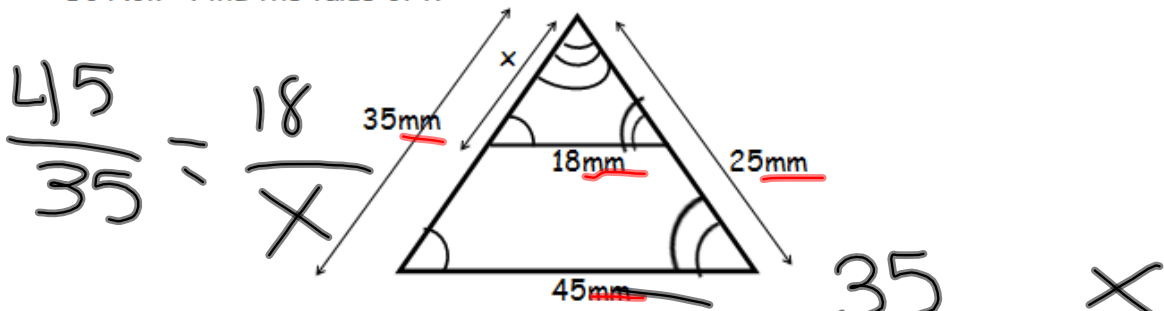
Handwritten work for problem 6:

$$\frac{8}{4} = \frac{10}{x}$$

$$8x = 40$$

$$x = 5$$

Do Now: Find the value of x:



$$\frac{45}{35} = \frac{18}{x}$$

$$\frac{x}{35} = \frac{18}{45}$$

$$\frac{45x}{45} = \frac{630}{45}$$

$$x = 14 \text{ mm}$$

$$\frac{35}{45} = \frac{x}{18}$$

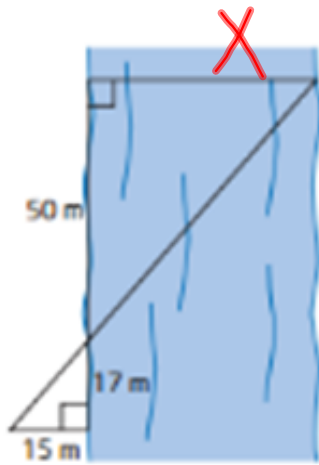
Solving Word Problems Using Similar Triangles

When solving a word problem involving similar triangles, it is helpful to draw a picture and label the corresponding parts of the triangles.

- Use a let statement to define your variable.
- Write a proportion using the corresponding sides, but be sure to be **CONSISTENT!**
- Your final answer should be a sentence.

Example 1:

Find the width of the river to the nearest meter



$$\frac{x}{15} = \frac{50}{17}$$

$$\frac{750}{17} = \frac{17x}{17}$$

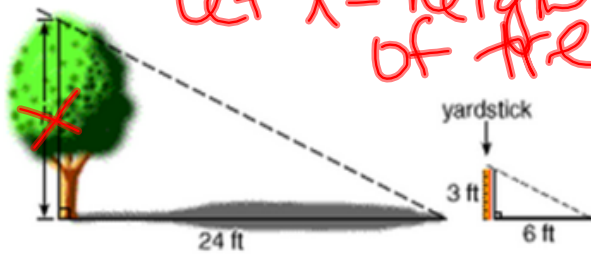
$$x = 44.11764706$$

$$\boxed{x = 44 \text{ m}}$$

The width of the river is 44 m.

Example 2:

A yardstick casts a 6 foot shadow *at the same time* a tree casts a shadow of 24 feet. How tall is the tree?



let $x =$ height of tree

NOTE: The phrase "at the same time" is important when dealing with problems involving shadows because the angle of the sun changes throughout the day.

$$\frac{x}{3} = \frac{24}{6}$$

$$\frac{72}{6} = \frac{\cancel{6}x}{\cancel{6}}$$

$$12^{\text{ft}} = x$$

The height of the tree is 12 feet.

Example 3:

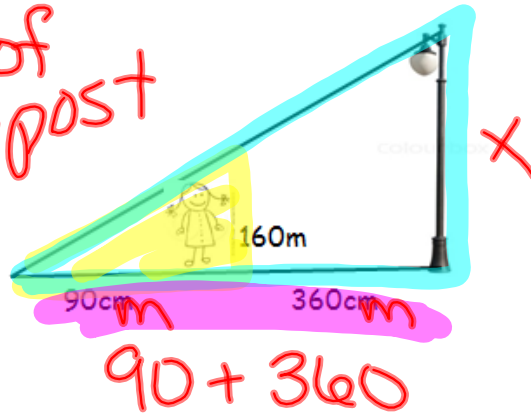
A girl 160 cm tall, stands 360 cm from a lamp post at night. Her shadow from the light is 90 cm long. How high is the lamp post?

let x = height of lamp post

$$\frac{90}{160} = \frac{450}{x}$$

$$\frac{72,000}{90} = \frac{90x}{90}$$

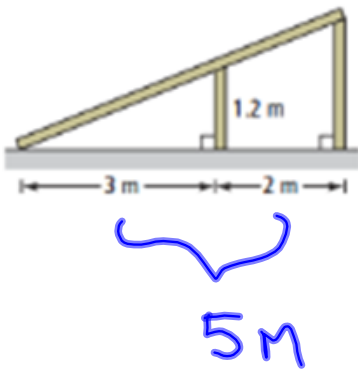
$$x = 800 \text{ m}$$



The height of the lamp post is 800 m.

Example 4:

Sam built a ramp to a loading dock. The ramp has a vertical support 2m from the base of the loading dock and 3m from the base of the ramp. If the vertical support is 1.2m in height, what is the height of the loading dock?



~~X~~ let $x =$ ^{height} ~~h~~ of loading dock

~~$\frac{x}{1.2} = \frac{5}{3}$~~

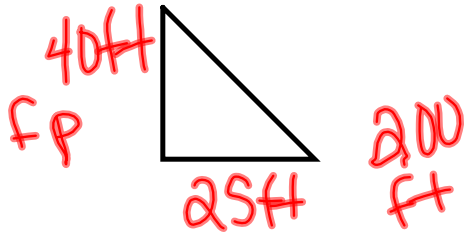
$\frac{5}{3}$

~~$\frac{3x}{3} = \frac{6}{3}$~~

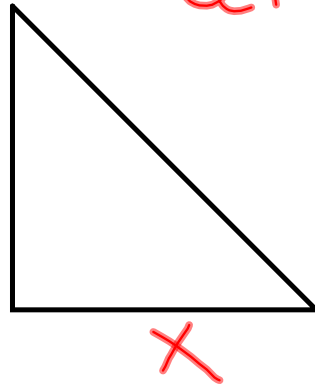
The loading dock is $x = 2$ $2m$.

Example 5:

A 40-foot flagpole casts a 25-foot shadow. Find the shadow cast by a nearby building 200 feet tall.



Let $x =$ height of shadow



$$\frac{25}{40} = \frac{x}{200}$$

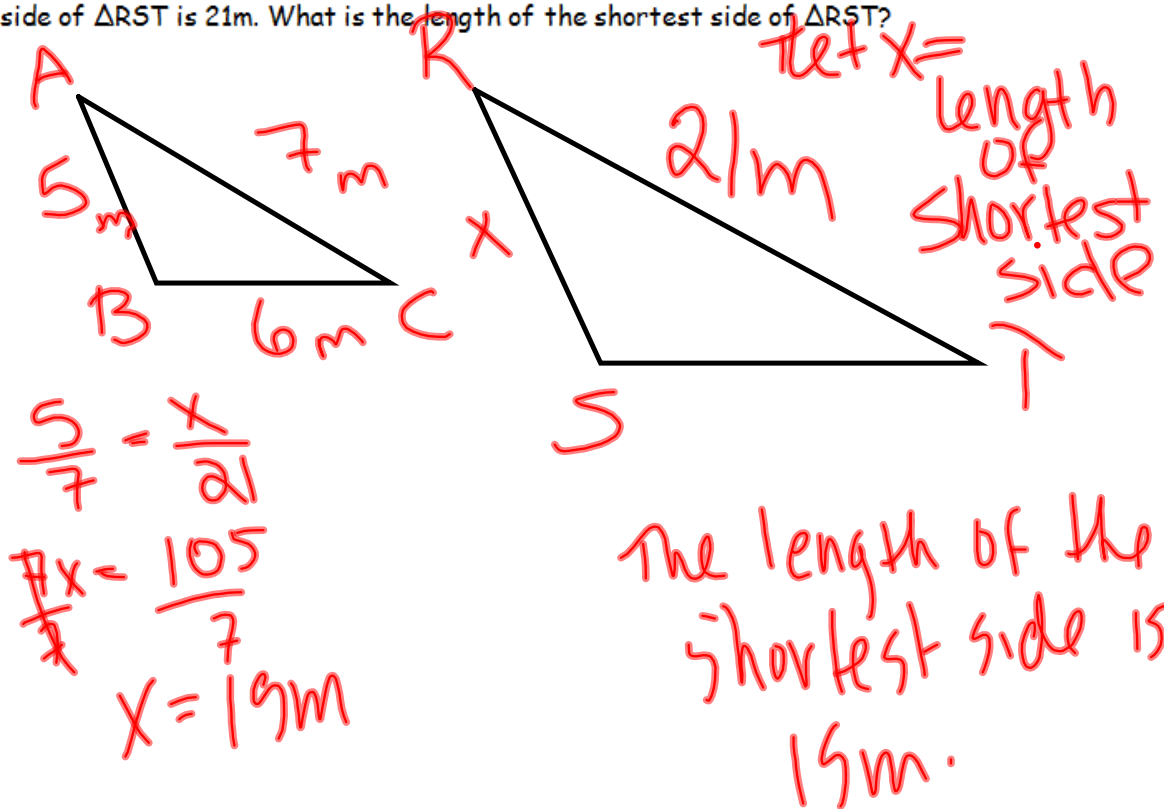
$$\frac{40x}{40} = \frac{5000}{40}$$

$$x = 125 \text{ ft}$$

The shadow of the building is 125ft.

Example 6:

The lengths of the sides of a $\triangle ABC$ are 5m, 6m, and 7m. Triangle RST is similar to $\triangle ABC$. The longest side of $\triangle RST$ is 21m. What is the length of the shortest side of $\triangle RST$?



$$\frac{5}{7} = \frac{x}{21}$$

$$\cancel{x} = \frac{105}{7}$$

$$x = 19m$$

Math 8

Word Problems Using Similar Triangles HW

Draw and label a diagram to represent each problem. Remember to use a let statement to define your variable, and answer with a sentence.

- 1) A person 6 feet tall casts a shadow 15 feet long. At the same time, a nearby tower casts a shadow 100 feet long. What is the height of the tower?

- 2) What is the height of a vertical pole that casts a shadow 8 feet long at the same time that another vertical pole 12 feet high casts a shadow 3 feet long?

- 3) The heights of two flagpoles are 20 feet and 30 feet. If the shorter pole casts a shadow of 8 feet, how long is the taller pole's shadow?

- 4) Mark wants to cut a triangular patch to make an emblem. The pattern for the emblem is a triangle with sides of 8, 8, and 10 cm. If Mark wants to make the longest side of the emblem 25 cm., how long should the other sides be?

- 5) On a map, the length from Cleveland to New York is 7cm, from Cleveland to Atlanta is 10cm, and from New York to Atlanta is 13cm. If on a larger map the length from Cleveland to New York is 17.5cm, what is the distance from Cleveland to Atlanta?