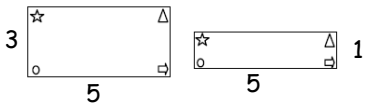
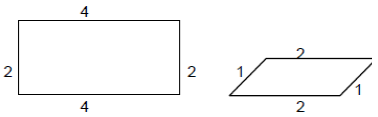
Warm - up: For each of the three examples below, determine whether they are similar or not.

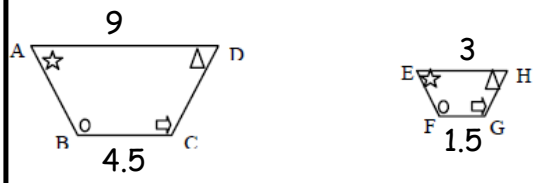
Similar: Yes or No?



Similar: Yes or No?



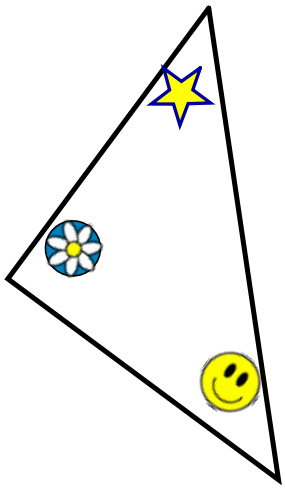
Similar: Yes or No?



Check in

Jan. 6, 2021

Mini lesson #2

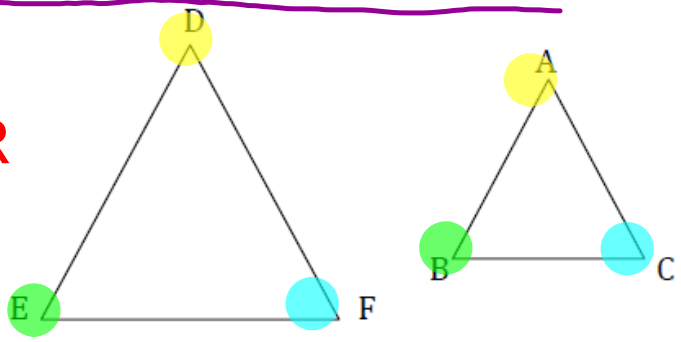


Section 7.4 **Similar Triangles** **Grade 9 Math**

Two triangles are similar if **they have the same shape but different size**.

In similar triangles:

- Matching angles are equal. OR
- Matching sides are proportional.



To write the similarity statement, corresponding angles and sides must match up.

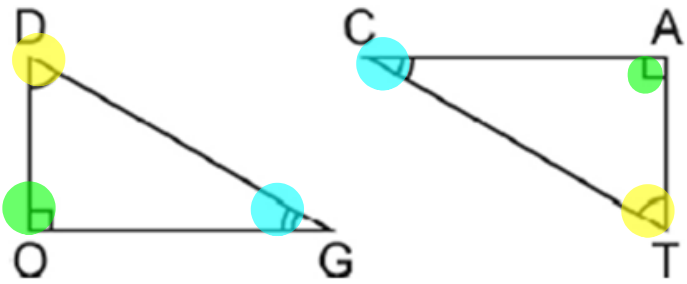
$\Delta ABC \sim \Delta DEF$

Can you write 6 true statements from the similarity of the two triangles?

1. $\angle A = \angle D$
2. $\angle B = \angle E$
3. $\angle C = \angle F$
4. $AB \backsim DE$ (is proportional to)
5. $BC \backsim EF$ (is proportional to)
6. $AC \backsim DF$ (is proportional to)

When writing proportions for corresponding sides, make sure to keep the **same triangle on top** in each fraction.

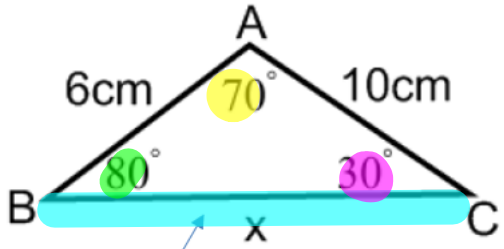
Practice 1: Identify the similar triangles.



$\triangle DOG \sim \triangle TAC$

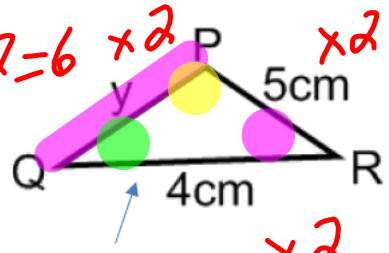
Example #1:

If $\Delta ABC \sim \Delta PQR$, find the angle of measures of ΔPQR and the missing side lenghts of x and y.



Scale Triangle

4x2=8



Original Triangle

y x2=6 x2 x2 SF

3

x2

Answer:

$\angle A = \angle P = 70^0$
$\angle B = \angle Q = 80^0$
$\angle C = \angle R = 30^0$

Can we determine a scale factor? SF = $\frac{scale\ length}{original\ length}$

SF = $\frac{10}{5} = 2$

Or cross multiply method: Write a proportion that includes only 1 unknown. Cross multiply and divide to solve:

$$\frac{AC}{PR} = \frac{BC}{QR}$$

$$\frac{10}{5} = \frac{x}{4}$$

$$(5)(x) = (10)(4)$$

$$5x = 40$$

x = 8cm

$$\frac{AC}{PR} = \frac{AB}{PQ}$$

$$\frac{10}{5} = \frac{6}{y}$$

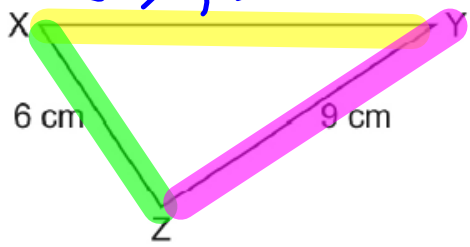
$$(10)(y) = (6)(5)$$

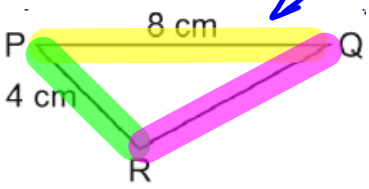
$$10y = 30$$

y = 3 cm

You try:

Determine the value of XY for the similar triangles





Scale ↓ XY=

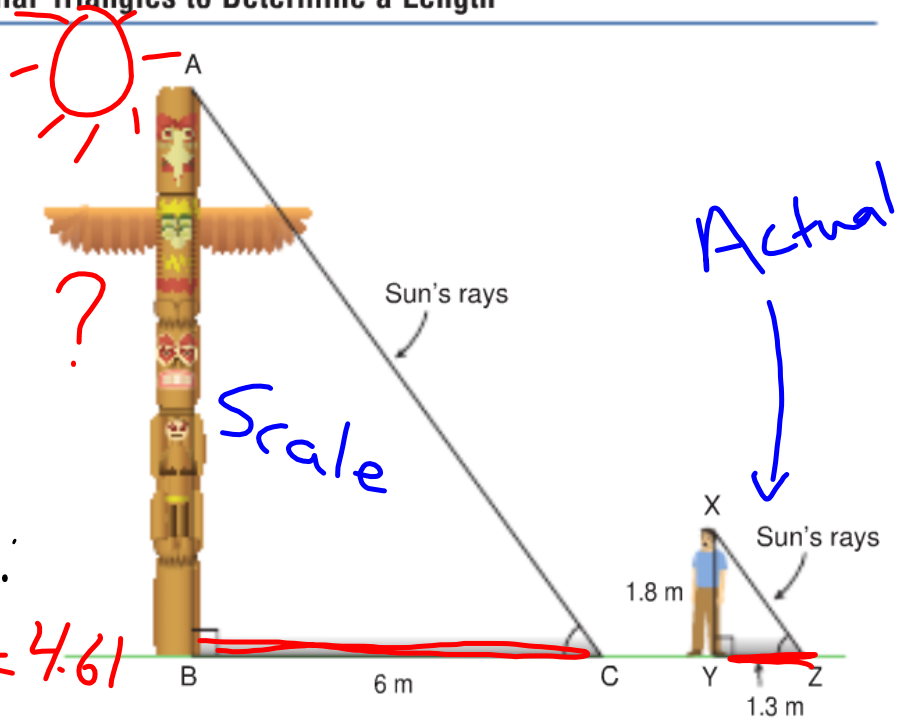
Act ↙

$SF = \frac{Scale}{Act} = \frac{6}{4} = 1.5$

$XY = 8 \times 1.5 = 12\text{cm}$

Example 2 Using Similar Triangles to Determine a Length

At a certain time of day, a person who is 1.8 m tall has a shadow 1.3 m long. At the same time, the shadow of a totem pole is 6 m long. The sun's rays intersect the ground at equal angles. How tall is the totem pole, to the nearest tenth of a metre?



Actual

Scale

?

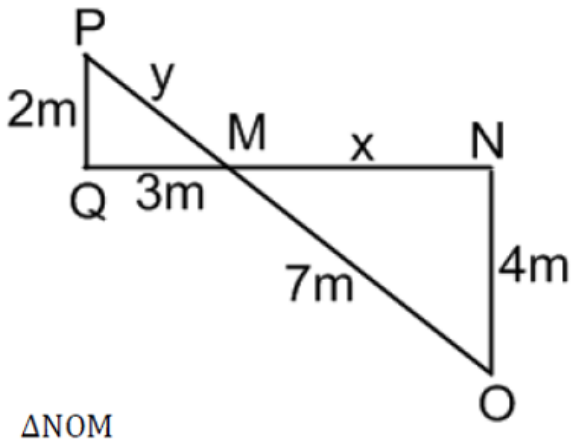
Scale factor:

$\frac{\text{Scale}}{\text{Actual}} = \frac{6}{1.3} = 4.61$

1.8×4.61

The height of the totem pole is 8.3m!

Example #3 Identify the similar triangles and identify the missing side lengths x & y:



Answer:

Match corresponding angles:
∠0 = ∠P
∠M = ∠M
∠N = ∠Q

Write the similarity statement: ΔQPM ~ ΔNOM

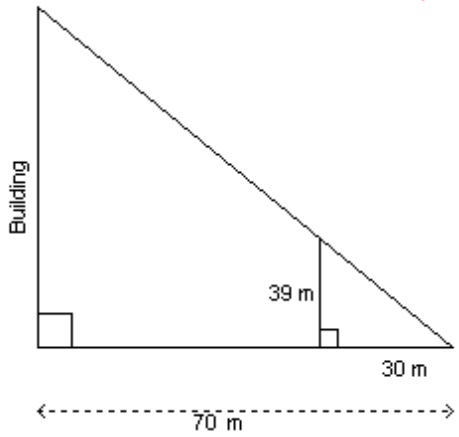
Write a proportion that includes only 1 unknown. Cross multiply and divide to solve.

$$\frac{PQ}{ON}=\frac{QM}{NM}$$
$$\frac{2}{4}=\frac{3}{x}$$
$$(2)(x)=(3)(4)$$
$$2x=12$$
$$x=\frac{12}{2}$$
$$x=6m$$

$$\frac{PQ}{ON}=\frac{PM}{OM}$$
$$\frac{2}{4}=\frac{y}{7}$$
$$(4)(y)=(2)(7)$$
$$4y=14$$
$$y=\frac{14}{4}$$
$$y=3.5m$$

This scale diagram shows the measurements a surveyor made to determine the height of a building. What is this height?

91 m



end of mini lesson #2