
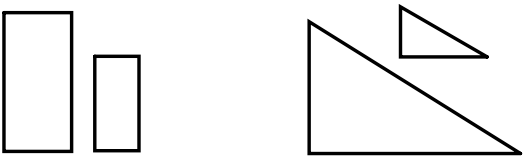

Unit 7: Similarities & Transformations

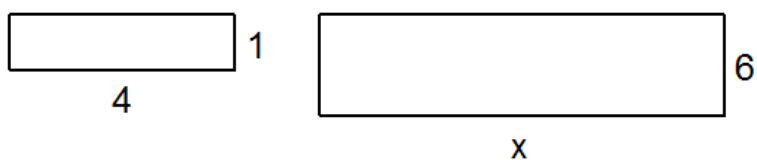
Lesson 1: Similar Shapes

- same shape, different sizes



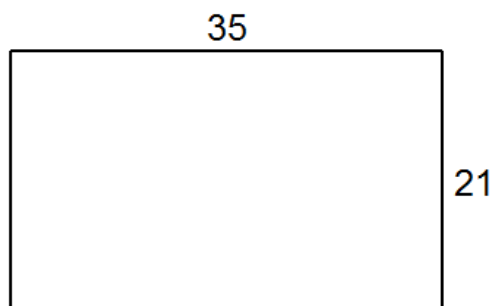
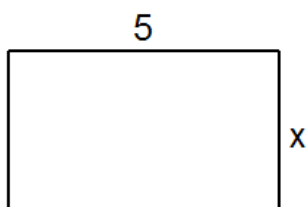


The scale factor is how many times bigger (or smaller) an object is.





We can also determine missing side lengths

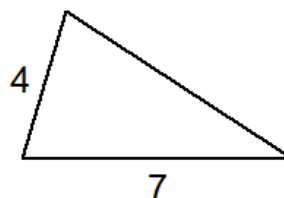
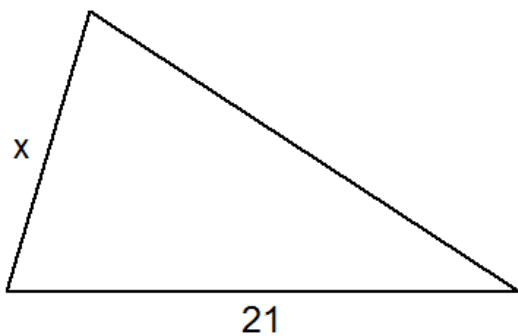


$x =$

Big \rightarrow Little = divide by scale



Find the scale and missing side length

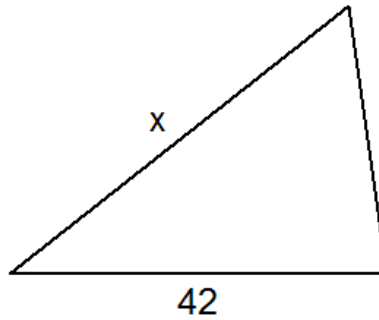
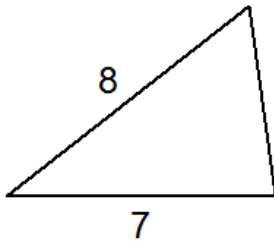


Little \rightarrow Big = multiply by scale





Find the scale and missing side length



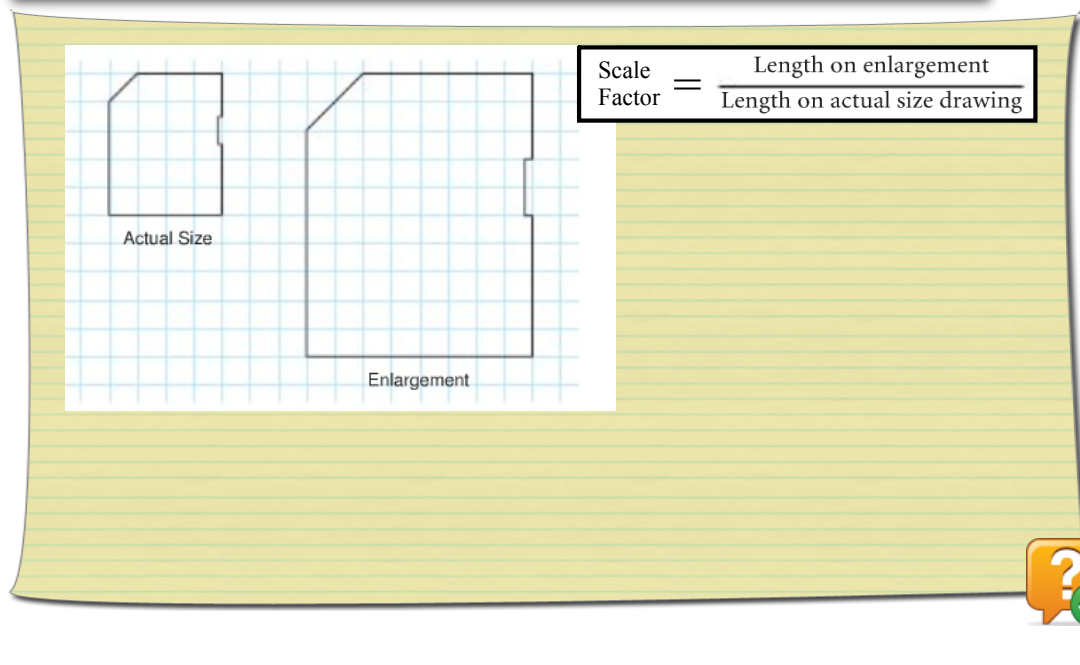
Homework

Complete worksheet "7.1 - Similar Shapes Practice"

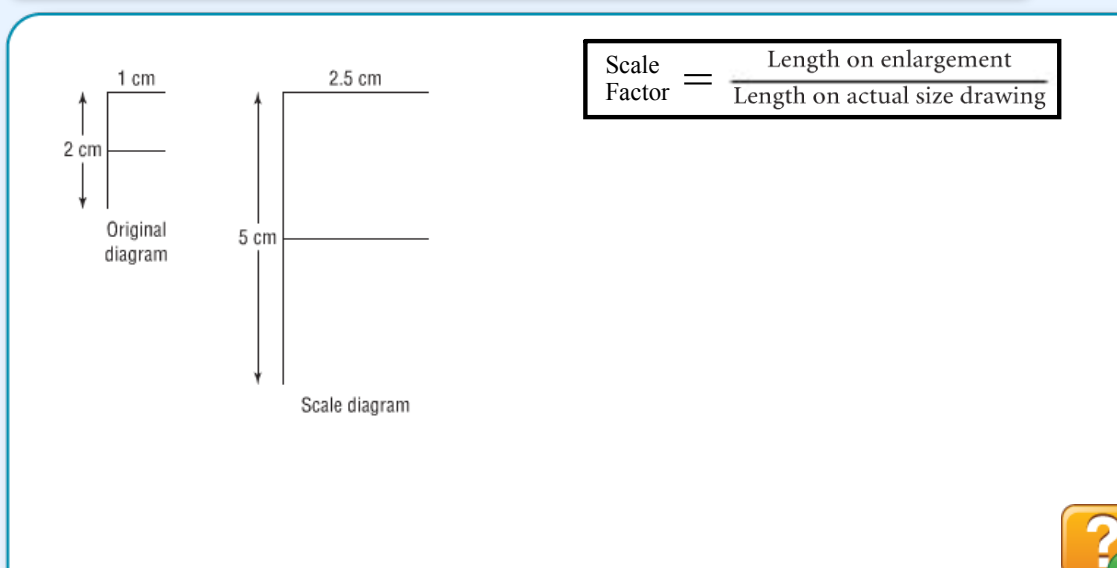




The following is a diagram of a memory card for a digital camera

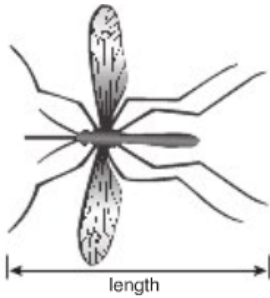


Determine the scale factor





This mosquito is 12 mm long.
In a magazine, its picture is 4.5 cm long.
Determine the scale factor.



$$\text{Scale Factor} = \frac{\text{Length on enlargement}}{\text{Length on actual size drawing}}$$



Enlargements & Reductions

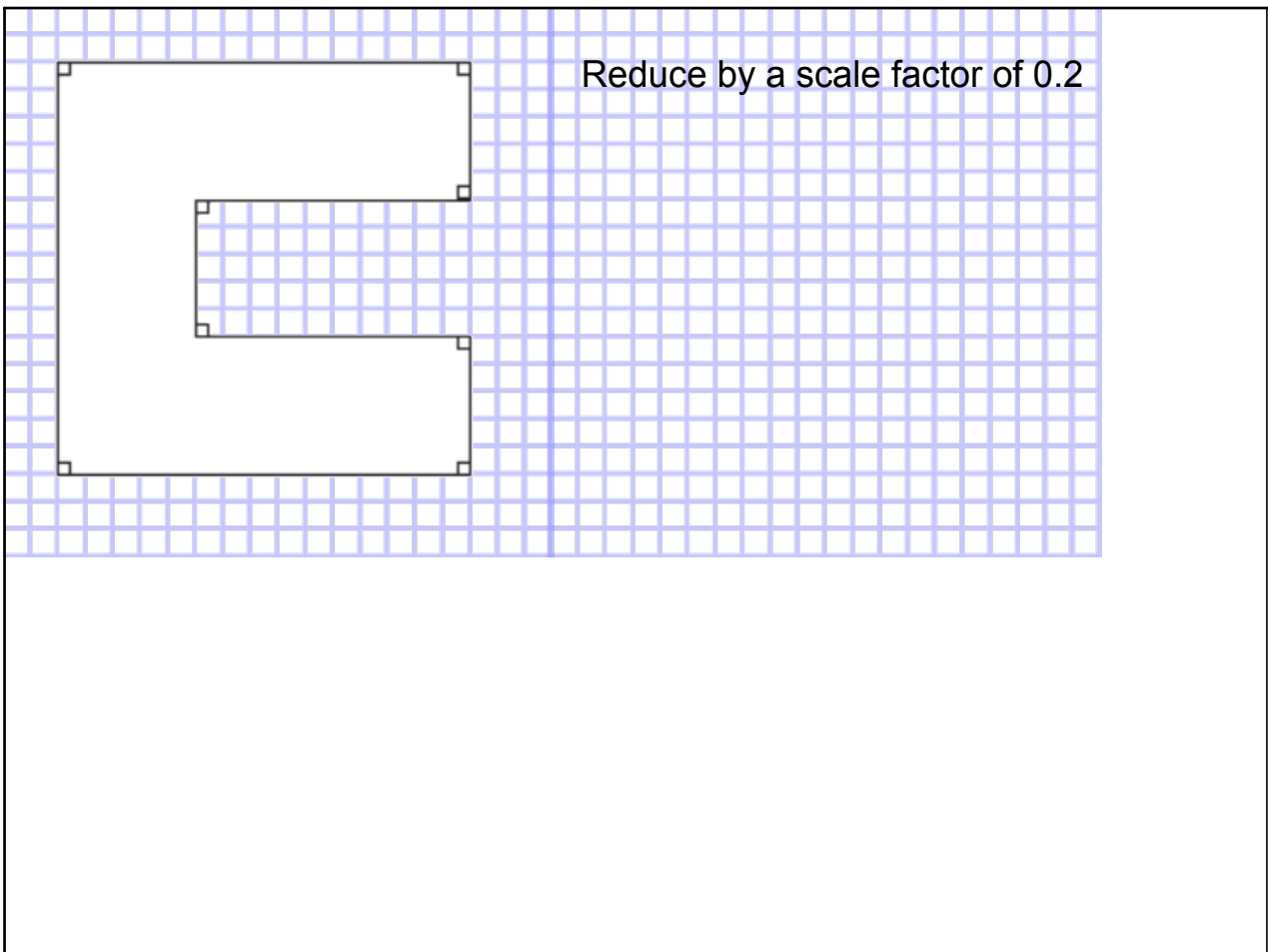
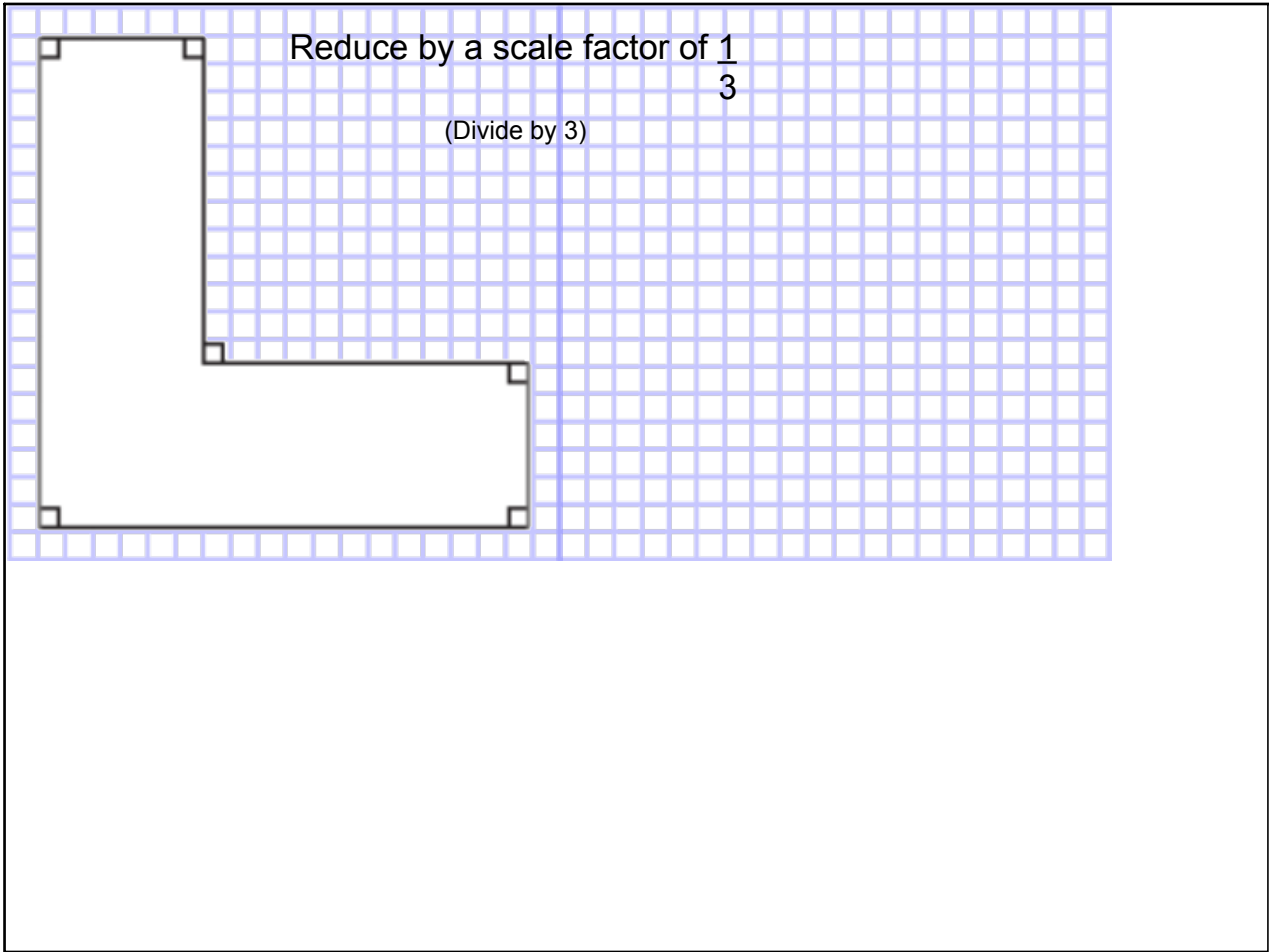
$$\text{Scale factor} = \frac{\text{Diameter of scale diagram}}{\text{Diameter of original diagram}}$$

Enlargements have scale factors greater than 1 (ex: 3, 2.5, 5)

Reductions have scale factors less than 1 (ex: 0.2, 0.5, 1/3)



Unit 7



7.3 - Similar Polygons

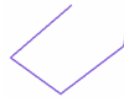
A **polygon** is any closed shape made up of line segments.



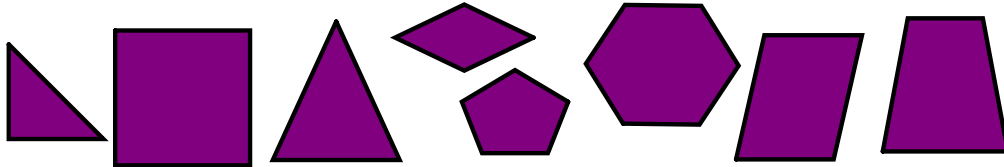
Polygon
(straight sides)



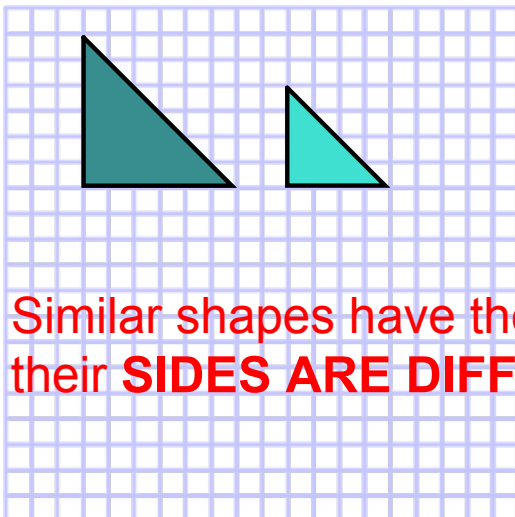
Not a Polygon
(has a curve)



Not a Polygon
(open, not closed)



Similar Shapes are enlargements or reductions of each other.



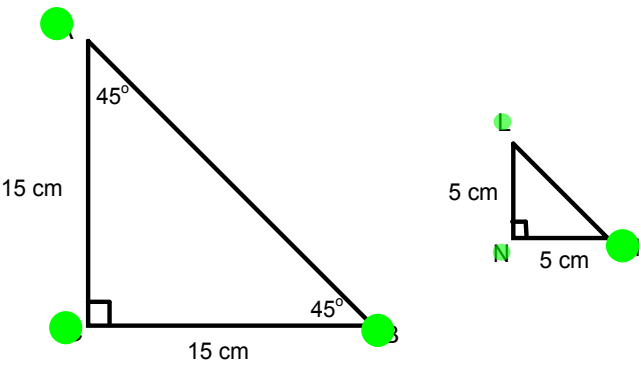
Calculate the scale factor of the reduction.

SF = _____ = _____

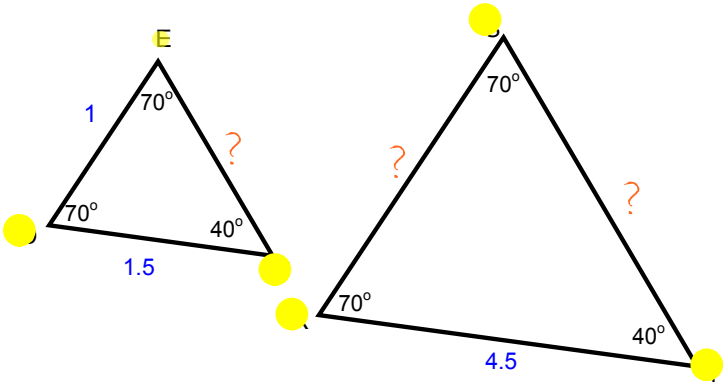
Similar shapes have the **SAME ANGLES**, but their **SIDES ARE DIFFERENT**.



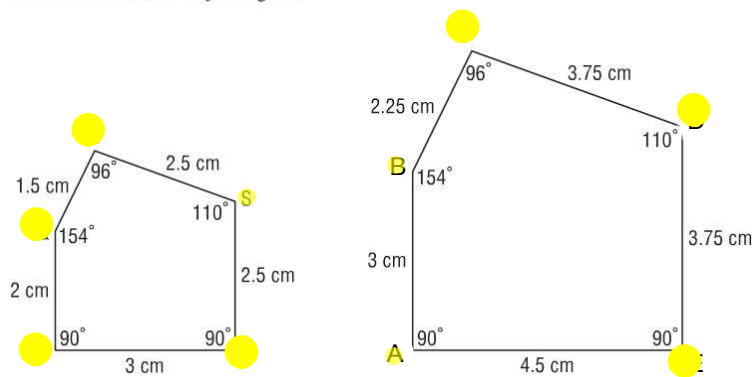
For example:



Determine the scale factor and missing side.



Here are two similar pentagons.



Write ratios (fractions) for each corresponding side to calculate the scale factor.

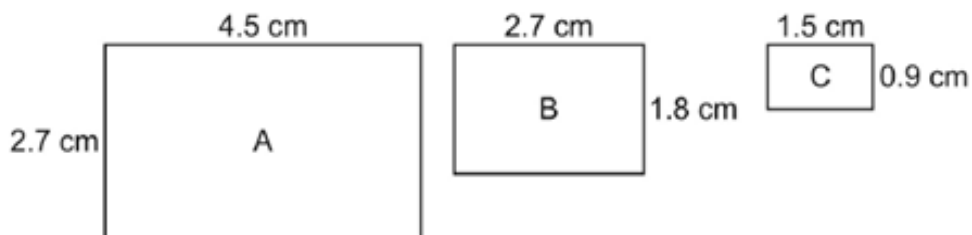
$$\frac{PQ}{AB} = \frac{2}{3}$$



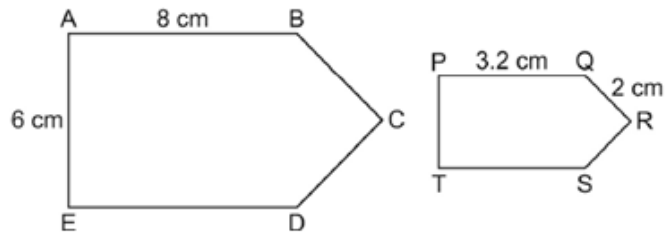
ANSWERS TO HOMEWORK

Sheet 7.3 - Similar Polygons

- 1.) Which rectangles are similar? Give reasons for your answer.

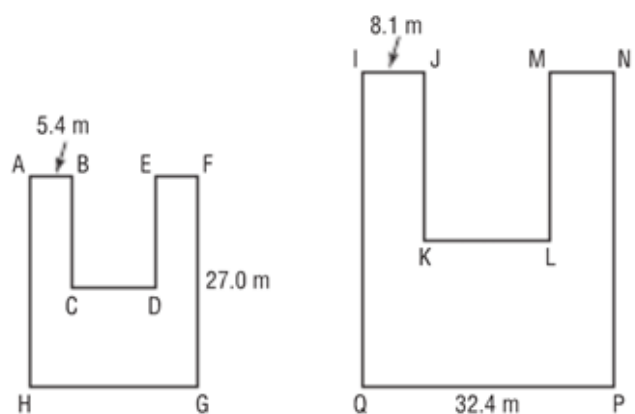


- 2.) These polygons are similar.
Determine each length.
a) PT
b) BC

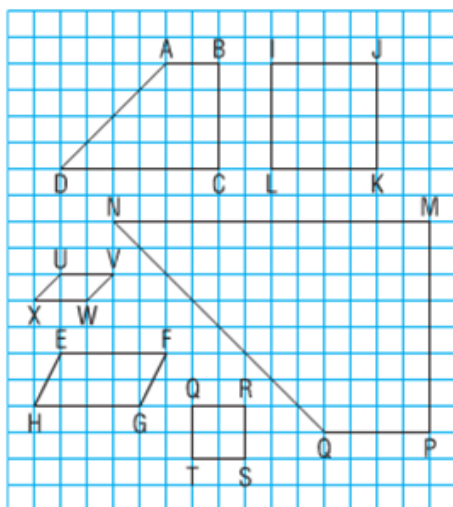


These two octagonal garden plots are similar.

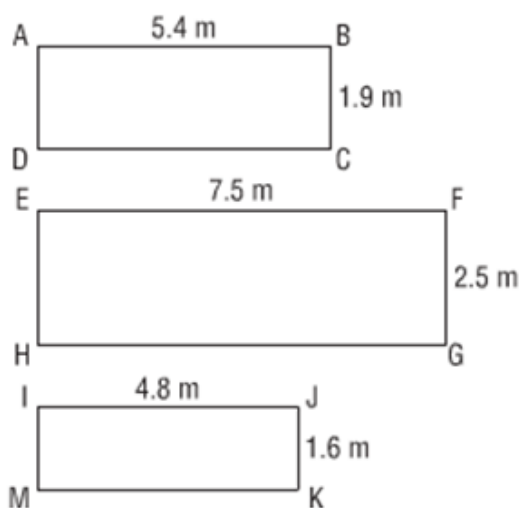
- a) Calculate the length of GH .
b) Calculate the length of NP .



- 4.) Identify similar quadrilaterals. List their corresponding sides and corresponding angles.



- 5.) Are any of these rectangles similar? Justify your answer.

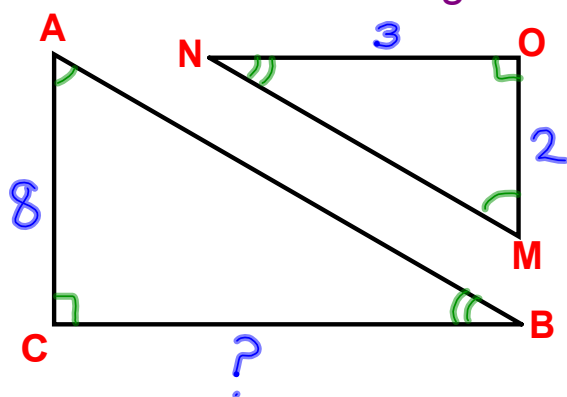




7.4 - Similar Triangles

Try This

These triangles are similar. 



1. Which angles are equal?

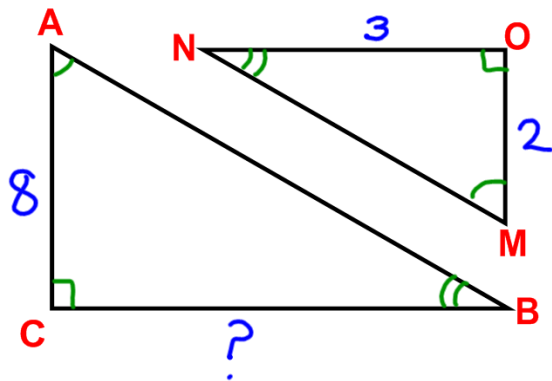
2. Which sides are similar?

$$\overline{AC} \sim \overline{MO}$$

3. Determine the missing side length.



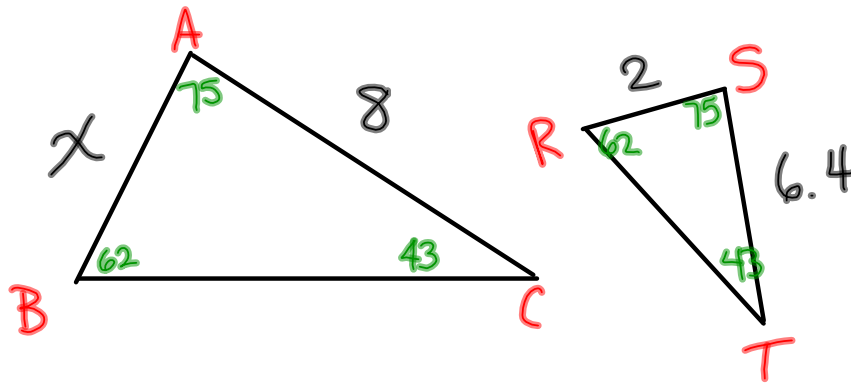
NEW STRATEGY: CROSS MULTIPLYING



$$\frac{8}{x} = \frac{2}{3}$$



Calculate the missing side length using
cross multiplication



Answers to Homework:

Date:

Name:

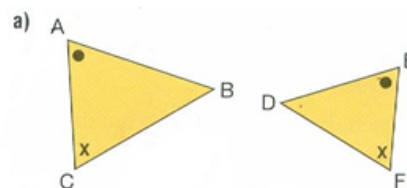
Answers

Lesson 7.4 – Similar Triangles Worksheet #2

1. For each pair of similar triangles, list the corresponding sides and angles.

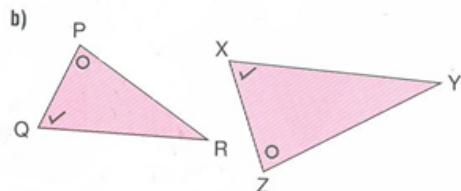
a) Corresponding sides and angles:

$\overline{AB} \sim \overline{ED}$	$\angle A = \angle E$
$\overline{BC} \sim \overline{DF}$	$\angle B = \angle D$
$\overline{CA} \sim \overline{FE}$	$\angle C = \angle F$

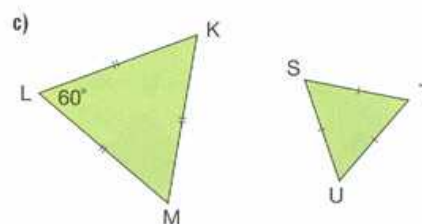
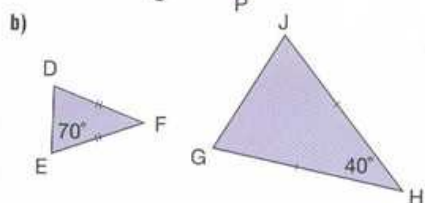
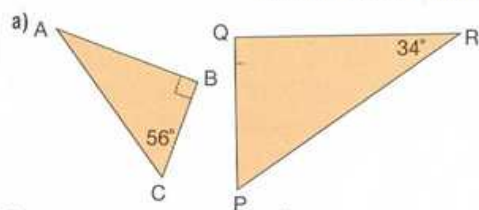


b) Corresponding sides and angles:

$\overline{PR} \sim \overline{ZY}$	$\angle P = \angle Z$
$\overline{RQ} \sim \overline{XY}$	$\angle R = \angle Y$
$\overline{QP} \sim \overline{XZ}$	$\angle Q = \angle X$

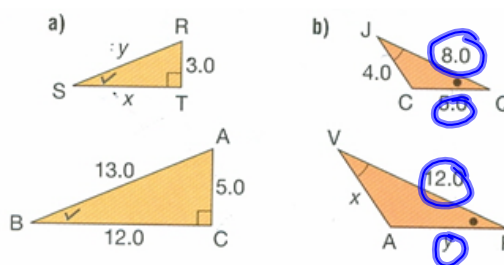


2. Each pair of triangles are similar. In each case, state the measures of the angles that are **not** marked.
(Remember: Angles of a triangle always add to 180° !!!)



A = 34°	D = 70°	K =
Q = 90°	J = 70°	M =
P = 56°	G = 70°	L =
	F = 40°	S =
		T =
		U =

3. Find the values of x and y , knowing that each set of triangles is similar.



$$b) \quad \frac{8}{12} = \frac{4}{x}$$

$$48 = 8x$$

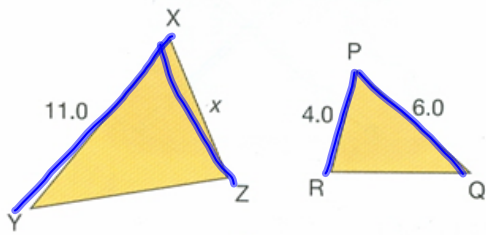
$$\boxed{x = 6}$$

$$\frac{8}{12} \neq \frac{5}{y}$$

$$\boxed{y = 7.5}$$

4. State the ratios (fractions) of the corresponding sides. Find each value of x.

a) $\triangle XYZ$ is similar to $\triangle PQR$.



$$\frac{6}{11} = \frac{4}{x}$$

$$44 = 6x$$

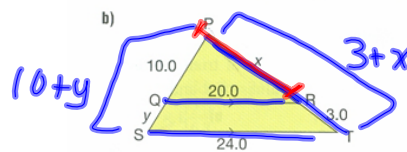
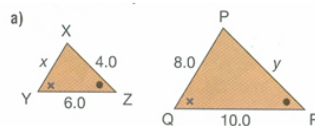
$$x = 7.\bar{3} \rightarrow 7\frac{1}{3}$$

b) $\triangle TAC$ is similar to $\triangle EAS$.



$$\frac{7}{12} = \frac{10}{x} \Rightarrow 120 = 7x \Rightarrow x = 17$$

5. State which triangles are similar. Find the values of x and y.



$$\frac{20}{24} = \frac{x}{3+x}$$

$$24x = 20(3+x)$$

$$24x = 60 + 20x$$

$$4x = 60$$

$$x = 15$$

$$\frac{20}{24} = \frac{10}{10+y}$$

$$240 = 200 + 20y$$

$$40 = 20y$$

$$2 = y$$

Answers to 7.4 Quiz:

1) a. $x = 5$ b. $x = 12$

2) a. $x = 10$ $y = 9$

Angles:

$F = B$

$D = A$

$E = C$

Sides:

$FD \sim BA$

$DE \sim AC$

$FE \sim BC$

b. $x = 9$ $y = 10$

Angles:

$K = G$

$J = I$

$L = H$

Sides:

$KJ \sim GI$

$JL \sim IH$

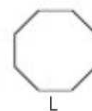
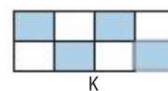
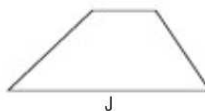
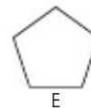
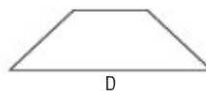
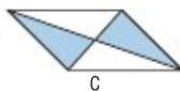
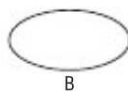
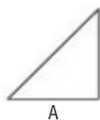
$LK \sim HG$

3) a. $x = 10$ $y = 18$
 b. $x = 4.8$ $y = 1.2$
 c. $x = 4.88$ $y = 15$

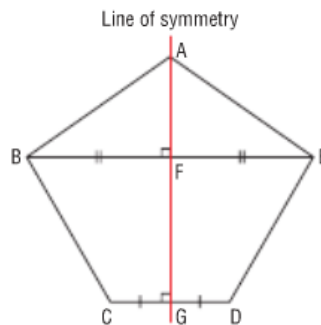
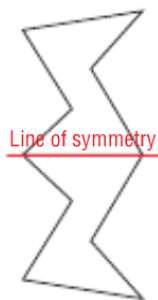


7.5 - Transformations

Which of these shapes have a line of symmetry?



A **line of symmetry** cuts a shape into two identical halves. It is also known as a **line of reflection**.



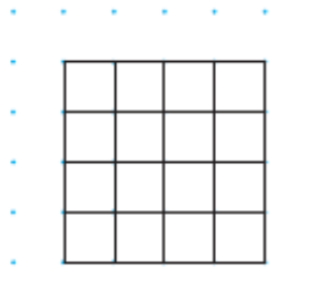
Example 1 Identifying Lines of Symmetry in Tessellations

Identify the lines of symmetry in each tessellation.

a)



b)



Which of the following shapes are a reflection of the **RED TRIANGLE**?
Draw the lines of symmetry.

?

Reflect the shape along $y = 2$.

