

If the above model car is 17.2 cm long what was the length of the original car?

$$SF = \frac{1}{24} = 0.041\bar{6}$$

$$\text{Scale} = 17.2$$

$$\text{Org} = ?$$

$$\text{Org} = \frac{\text{Scale}}{SF}$$

$$\text{Org} = \frac{17.2}{0.041\bar{6}}$$

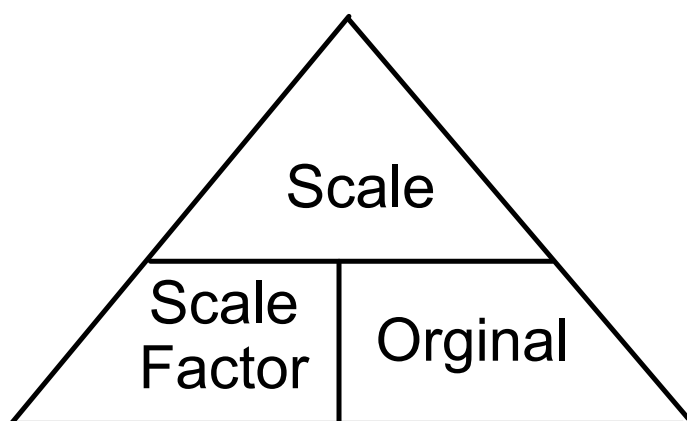
$$\text{Org} = 412.8 \text{ cm}$$

$$SF = \frac{\text{Scale}}{\text{Org.}}$$

$$\frac{1}{24} = \frac{17.2}{x}$$

$$x = 412.8 \text{ cm}$$

Overview

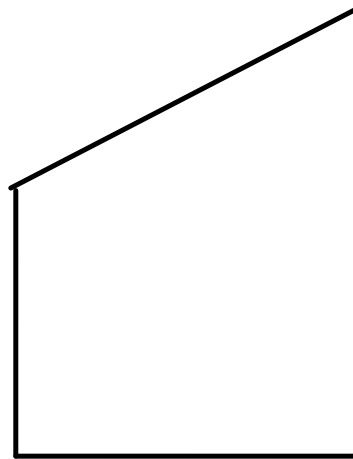
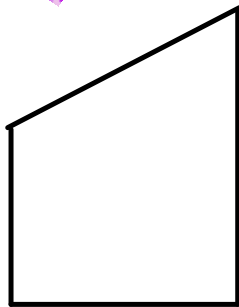


$$\frac{SF}{1} = \frac{\text{Scale}}{\text{Org}}$$



Setion 7.3

Similar Polygons



Polygons are 2-dimensional shapes. They are made of straight lines, and the shape is "closed" (all the lines connect up).



Polygon
(straight sides)



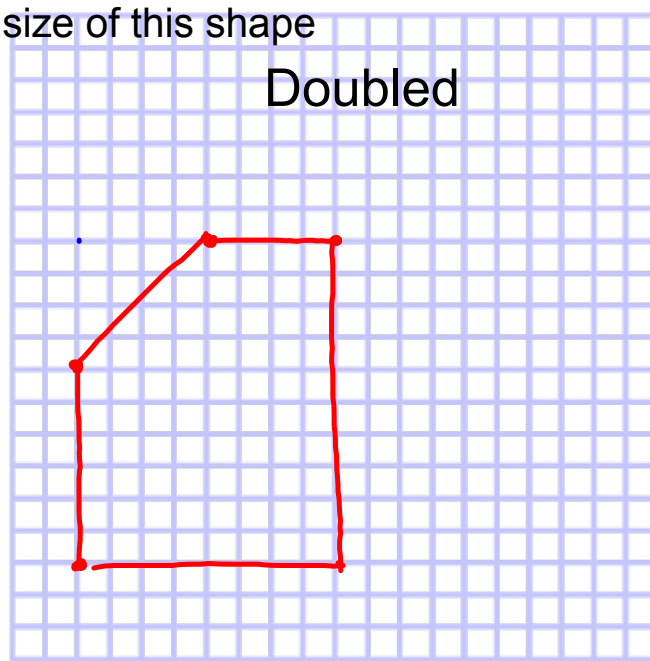
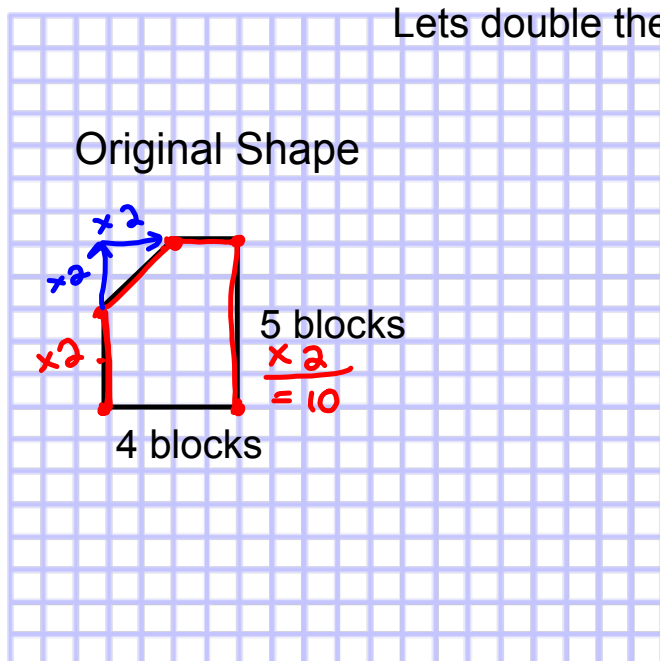
Not a Polygon
(has a curve)



Not a Polygon
(open, not closed)

Activity

Lets double the size of this shape



Similar Polygons: are enlargements or reductions of each other
: Same shape, but not necessarily the same size

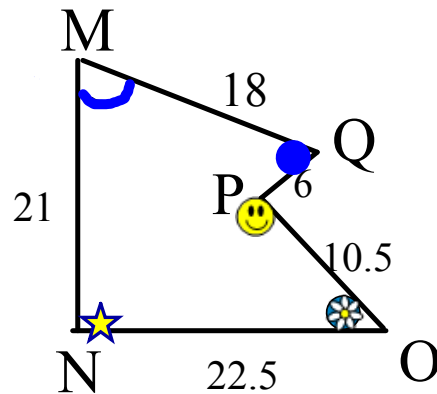
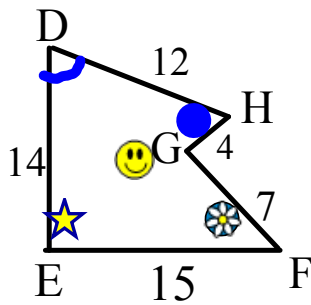
Corresponding: similar in position or purpose
: the same size; reduced or enlarged
- between same scaled sides

Properties of Similar Polygons
Their corresponding angles are <u>equal</u>
Their corresponding sides are <u>proportional</u>

**BOTH
MUST BE
TRUE**

Symbol for similar is \sim

Are the following Similar Polygons?



→ Similarity Statement

Match up the Angles

Polygon **DEFGH**

Polygon **MNPQ**

Ratios.

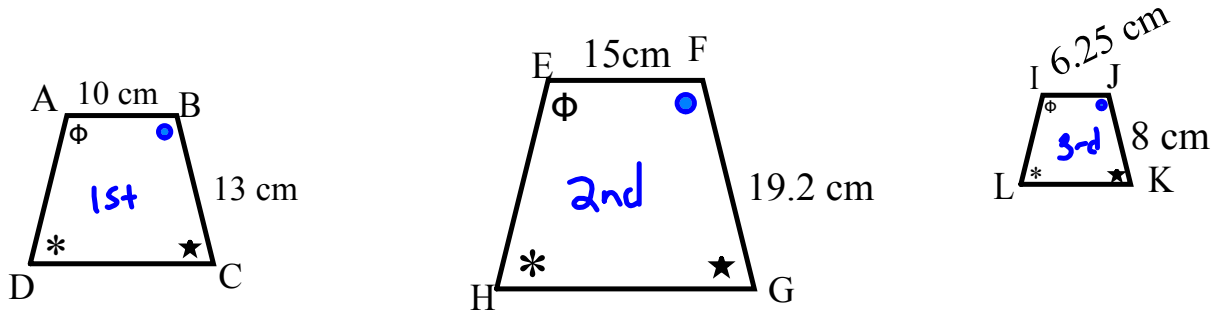
$$\frac{DE}{MN} = \frac{EF}{NO} = \frac{FG}{OP} = \frac{GH}{PQ} = \frac{DH}{MQ}$$

$$\frac{14}{21} = \frac{15}{22.5} = \frac{7}{10.5} = \frac{4}{6} = \frac{12}{18}$$

$$0.\overline{6} = 0.\overline{6} = 0.\overline{6} = 0.\overline{6} = 0.\overline{6}$$

Identifying Similar Polygons

Which two polygons are similar?



Compare Polygon 1st & 2nd

Compare Polygon 2nd & 3rd

$$\begin{aligned}
 & ABCD \sim EFGH \\
 & \frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{AD}{EH} \\
 & \frac{10}{15} = \frac{13}{19.2} = \frac{CD}{GH} = \frac{AD}{EH} \\
 & 0.67 = 0.67
 \end{aligned}$$

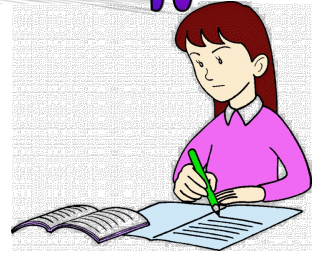
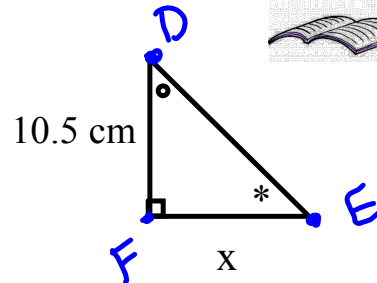
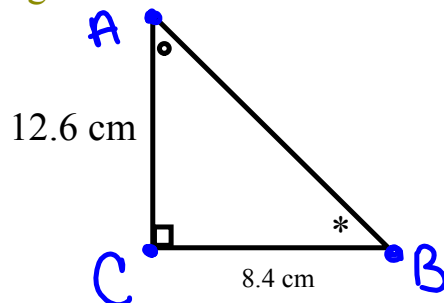
$$\begin{aligned}
 & EFGH \sim IJKL \\
 & \frac{EF}{IJ} = \frac{FG}{JK} = \frac{GH}{KL} = \frac{EH}{IL} \\
 & \frac{15}{6.25} = \frac{19.2}{8} = \frac{GH}{KL} = \frac{EH}{IL} \\
 & = 2.4 = 2.4
 \end{aligned}$$

Compare Polygon ABCD and IJKL

Solving Problems Using the Properties of Similar Polygons

Example 1)

Find the length of the side labeled "x"



$$\triangle ABC \sim \triangle DEF$$

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

$$\frac{AB}{DE} = \frac{8.4}{x} = \frac{12.6}{10.5}$$

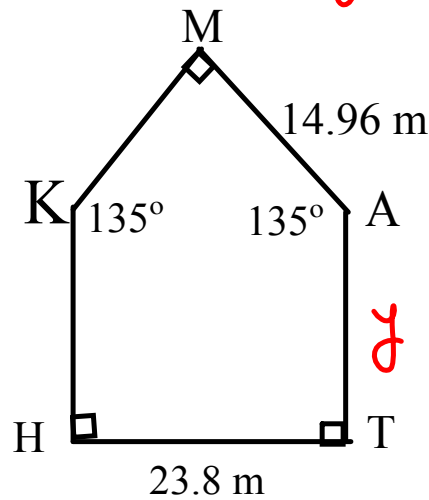
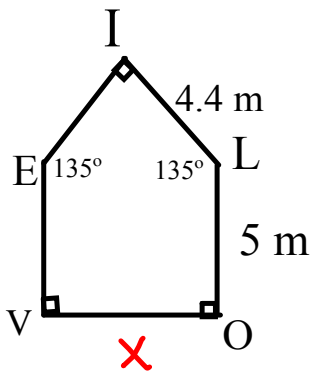
$$\frac{12.6x}{12.6} = \frac{88.2}{12.6}$$

$$x = 7$$

Solving Problems Using the Properties of Similar Polygons

These two polygons are similar.

- a) Calculate the length of VO. (x)
- b) Calculate the length of AT (y)



Class/Homework

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4, 5, 6, 9, 11, 13, 14, 16

