Circle Limit IV
by M.C. Escher

M.C. Escher was a Dutch graphic artist known for drawing impossible structures, spatial illusions, and repeating interlocking geometric patterns.

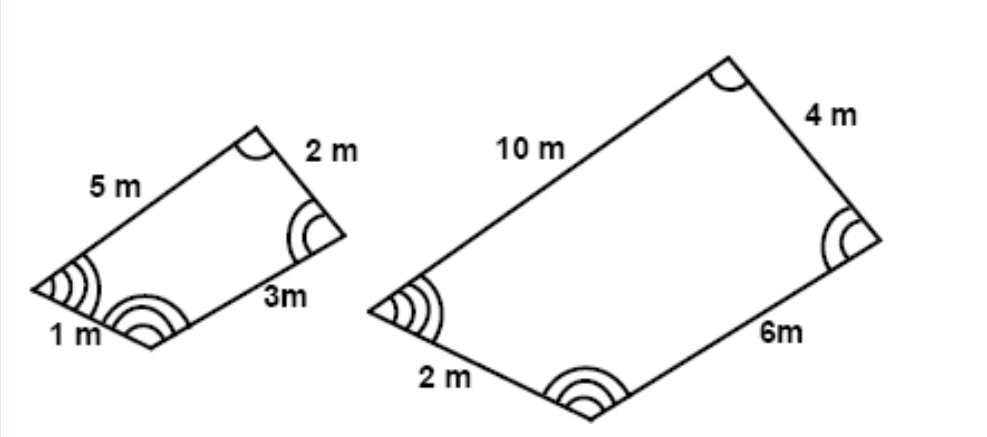
What do you notice about the figures in the carving?

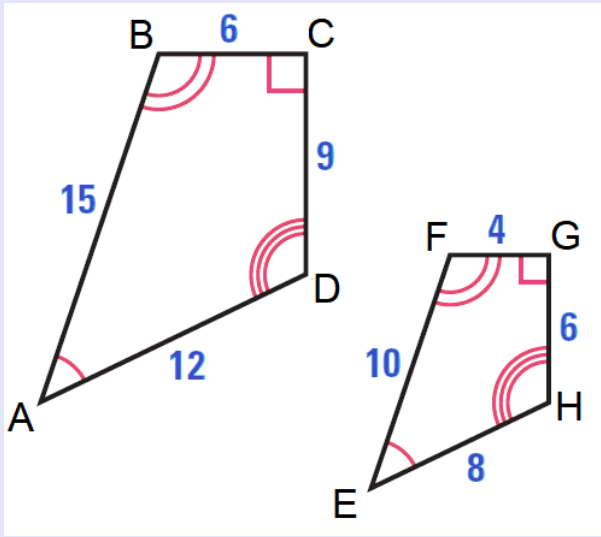
Section 7.2 - Similar Polygons

Goals: Identify if polygons are similar or not, calculate the scale factor, use proportions to find missing sides

Similar: figures that have the same shape but may be different sizes

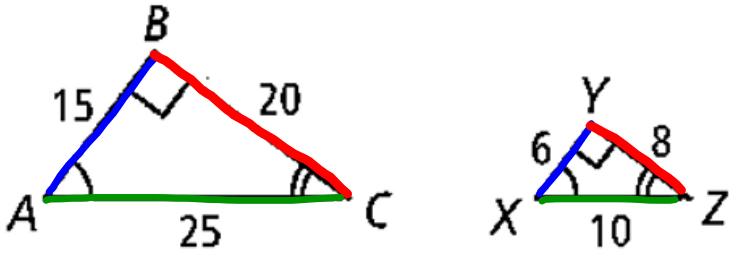
- **Corresponding angles** are **congruent.**
- **Corresponding sides** are **proportional.**





Fill in this example in your notes.

Are these triangles similar?



Are corresponding angles congruent?

Yes - all pairs of angles have congruent marks

Are corresponding sides proportional? Yes

$\frac{15}{6} = \frac{5}{2}$ $\frac{20}{8} = \frac{5}{2}$ $\frac{25}{10} = \frac{5}{2}$

SIMILARITY STATEMENT:

a statement stating two figures are similar

$\Delta ABC \sim \Delta XYZ$

$\sim$ means similar

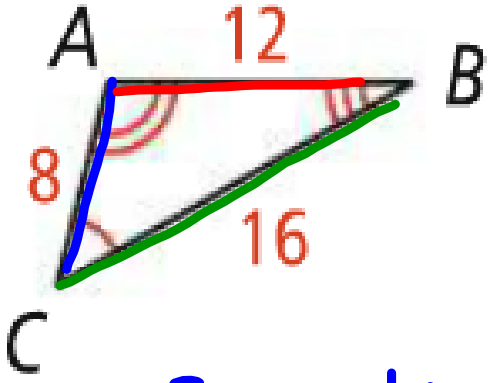
SCALE FACTOR:

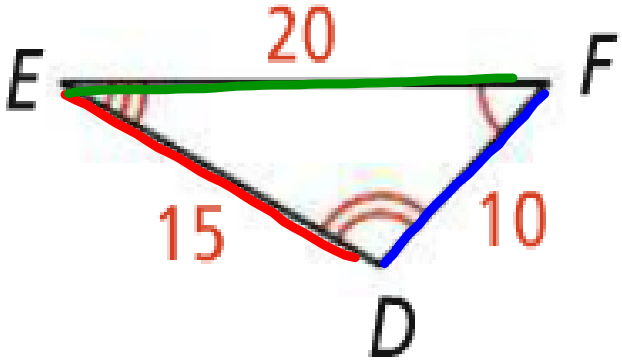
the ratio of corresponding sides for two similar polygons

$\frac{5}{2}$ or 2.5

ΔABC is 2.5 times bigger than ΔXYZ.

Determine whether the pair of figures is similar. If they are write a similarity statement and the scale factor.

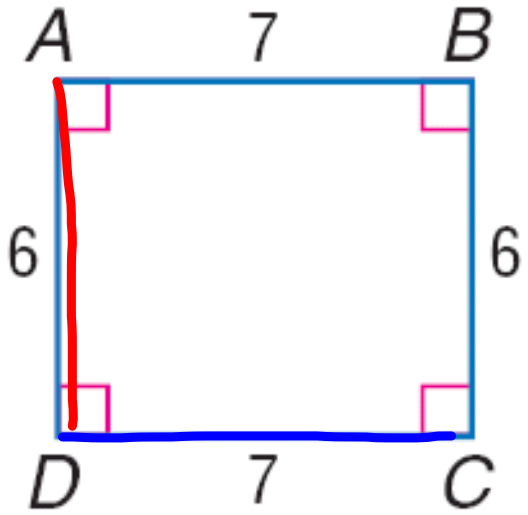


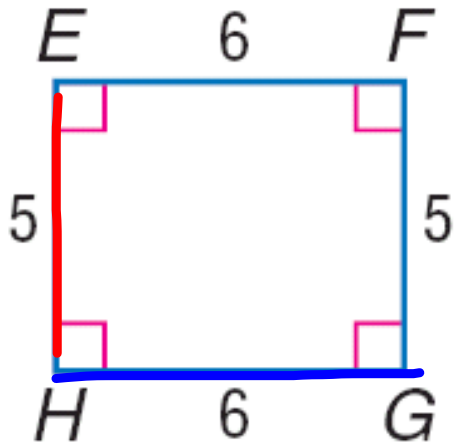


$\frac{8}{10} = \frac{4}{5}$ $\frac{12}{15} = \frac{4}{5}$ $\frac{16}{20} = \frac{4}{5}$

$\triangle ABC \sim \triangle DEF$ Scale Factor: $\frac{4}{5}$

Determine whether the pair of figures is similar. If they are write a similarity statement and the scale factor.

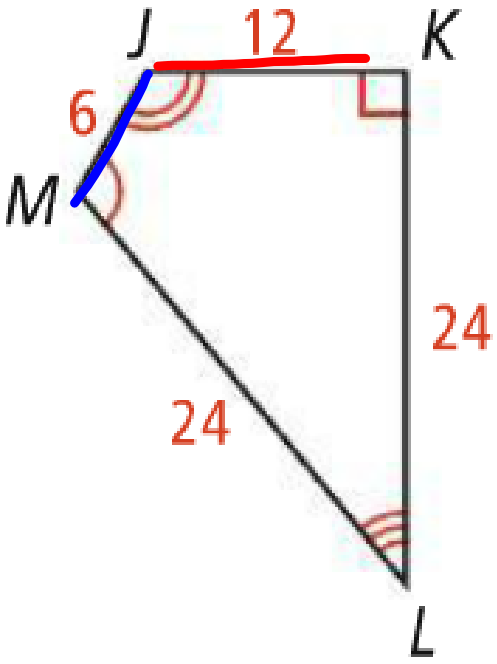


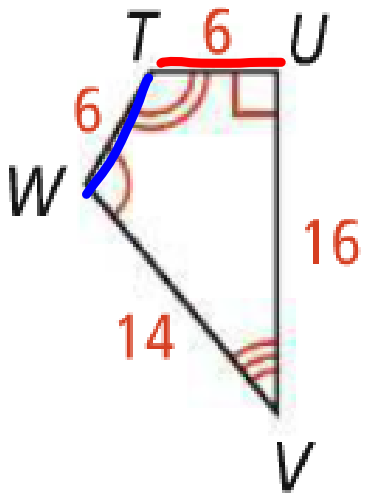


$\frac{6}{5} \neq \frac{7}{6}$

They are not Similar

Determine whether the pair of figures is similar. If they are write a similarity statement and the scale factor.

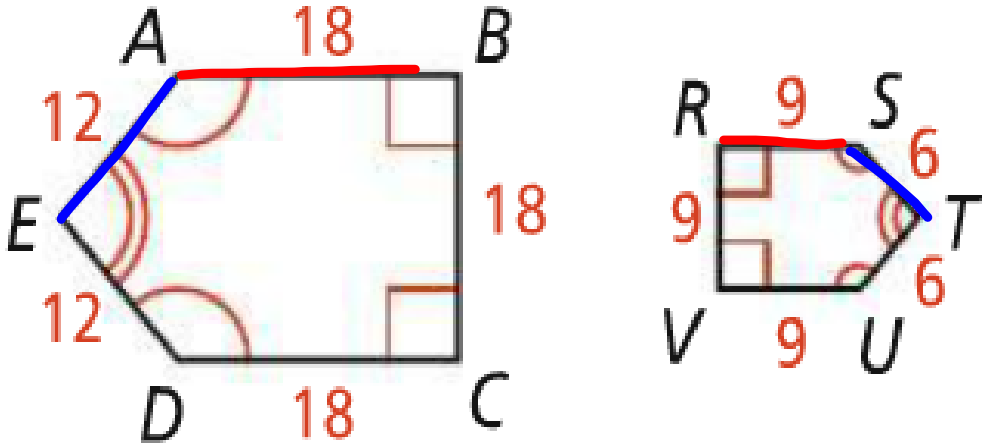




$\frac{6}{6} = 1$ $\frac{12}{6} = 2$

Not Similar

Determine whether the pair of figures is similar. If they are write a similarity statement and the scale factor.



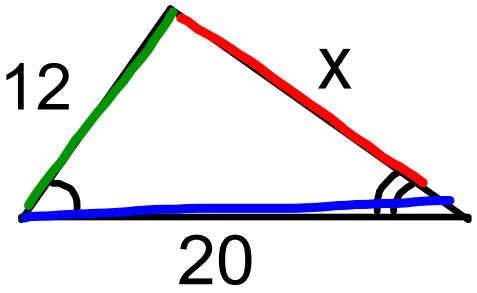
$\frac{12}{6} = 2$ $\frac{18}{9} = 2$

ABCDE ~ STUVR Scale Factor = 2

Finding Missing Measures

When two polygons are similar, a proportion can be used to find missing side measures.

Find the value of x and y.



$$\frac{20}{15} = \frac{x}{12}$$

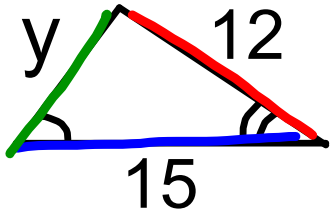
$$240 = 15x$$

$$16 = x$$

$$\frac{20}{15} = \frac{12}{y}$$

$$20y = 180$$

$$y = 9$$



Assignment:

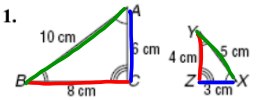
Concept 17 Worksheet

(front) - must show work on 7-9

SIMILAR POLYGONS

Is each pair of polygons similar? If yes, write a similarity statement and the scale factor. If no, explain why.

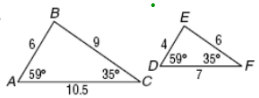
1.



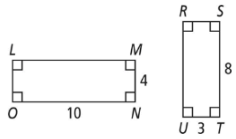
$\frac{6}{3}=2$ $\frac{8}{4}=2$ $\frac{10}{5}=2$

$\triangle ABC \sim \triangle XYZ$ $SF=2$

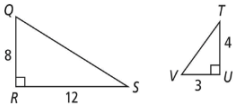
2.



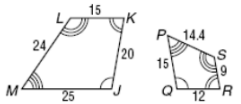
3.



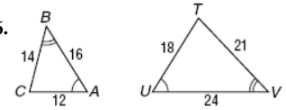
4.



5.



6.



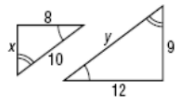
The two polygons are similar. Find x and y. You must show your work.

7.

$x =$ _____

$y =$ _____

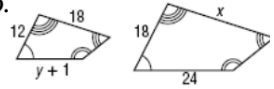
8.



$x =$ _____

$y =$ _____

9.



$x =$ _____

$y =$ _____