

**Geometry - DAY 2.5**  
**Similar Polygons**

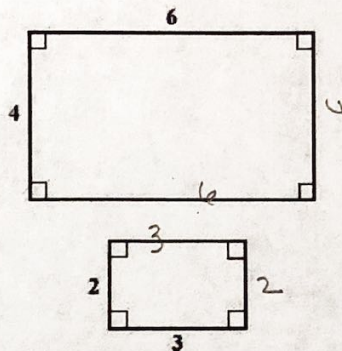
Name Key  
Date \_\_\_\_\_

Two polygons are similar if and only if

- > their corresponding angles are congruent
- > their corresponding sides are proportional

The symbol  $\sim$  is read "is similar to".

The two rectangles are similar because all corresponding angles measure 90 degrees. All corresponding sides have a ratio of 2/1.

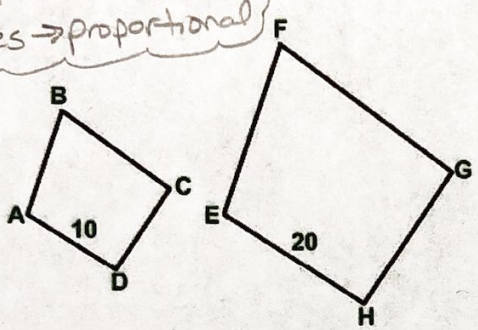


Angles  $\rightarrow$  congruent  
Sides  $\rightarrow$  proportional

Similar

$$\frac{6}{3} = \frac{4}{2} = \frac{2}{1}$$

$ABCD \sim EFGH$



- Congruent
- $\angle A \cong \angle E$
  - $\angle B \cong \angle F$
  - $\angle C \cong \angle G$
  - $\angle D \cong \angle H$

$$\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{AD}{EH}$$

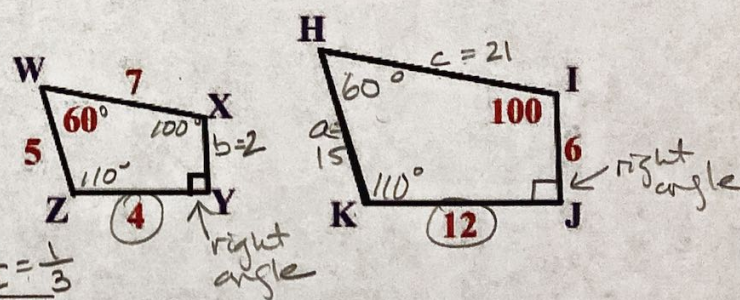
The ratio of polygon ABCD to polygon EFGH is  $\frac{10}{20} = \frac{1}{2}$ .

Start

Given  $WXYZ \sim HIJK$

Equal

1.  $m\angle H = 60^\circ$
2.  $m\angle J = 90^\circ$
3.  $m\angle X = 100^\circ$
4. If  $m\angle Z = 110^\circ$ , then  $m\angle K = 110^\circ$
5. The ratio of quad.  $WXYZ$  to quad  $HIJK$  is  $\frac{4}{12} = \frac{1}{3}$



6.  $HK = \frac{15}{\frac{4}{12}} = \frac{15}{\frac{1}{3}} = 45$       7.  $XY = \frac{2}{\frac{4}{12}} = \frac{2}{\frac{1}{3}} = 6$       8.  $HI = \frac{21}{\frac{4}{12}} = \frac{21}{\frac{1}{3}} = 63$        $4c = 84$

Solve for x.

9.  $x = 10$

10.  $x = 10$

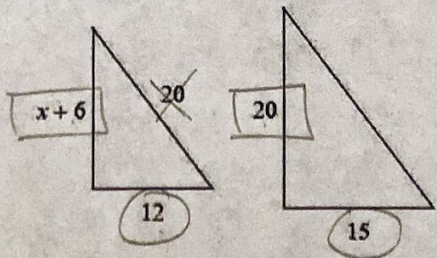
$$\frac{12}{15} = \frac{x+6}{20}$$

$$15(x+6) = 12(20)$$

$$15x + 90 = 240$$

$$15x = 150$$

$$x = 10$$



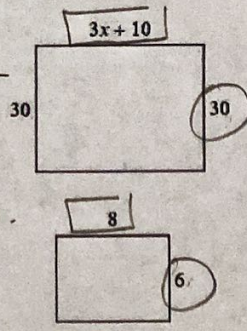
$$\frac{6}{30} = \frac{8}{3x+10}$$

$$6(3x+10) = 8(30)$$

$$18x + 60 = 240$$

$$18x = 180$$

$$x = 10$$



**Classwork PRACTICE**

$\triangle CAT \sim \triangle DOG$

Given  $\triangle CAT \sim \triangle DOG$ .

1. Corresponding angles are congruent.

$\angle C \cong \angle D$        $\angle T \cong \angle G$        $\angle A \cong \angle O$

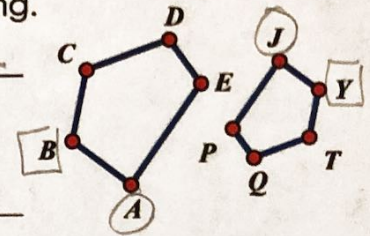
2. Corresponding sides are proportional.

$\frac{CA}{DO} = \frac{AT}{OG} = \frac{CT}{DG}$

3. Pentagon ABCDE is similar to Pentagon JYTQP. Complete the following.

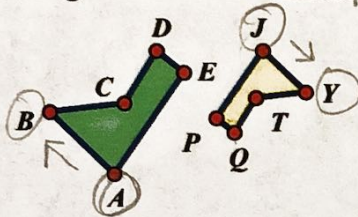
$\angle E \cong \angle P$        $\frac{AB}{JY} = \frac{CD}{TQ}$        $\frac{AB}{CD} = \frac{JY}{TQ}$

$\angle T \cong \angle C$        $\frac{TQ}{CD} = \frac{PJ}{EA}$        $\frac{CD}{DE} = \frac{TQ}{QP}$

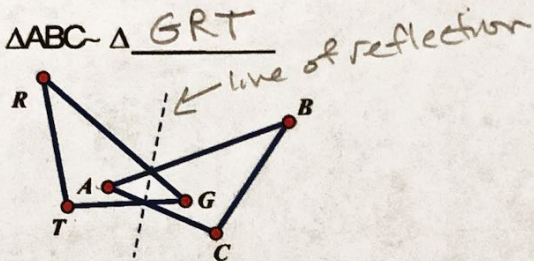


4. The two figures in each question are similar. Create the similarity statement from the diagram.

a) Pentagon ABCDE ~ JYTQP

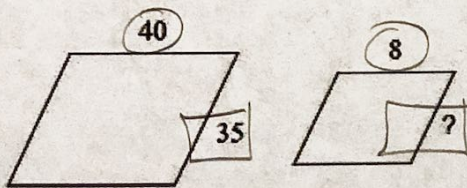


b)  $\triangle ABC \sim \triangle GRT$



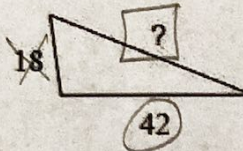
Find the missing side.

5.



$\frac{40}{8} = \frac{35}{x}$   
 $40x = 8(35)$   
 $40x = 280$   
 $x = 7$

6.

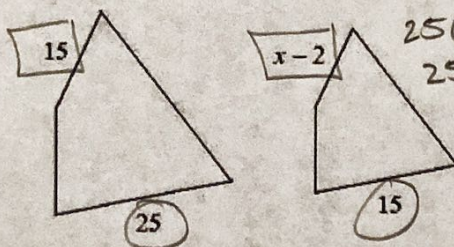


$\frac{x}{40} = \frac{42}{35}$   
 $35x = 40(42)$   
 $35x = 1680$   
 $x = 48$

Now what about these?

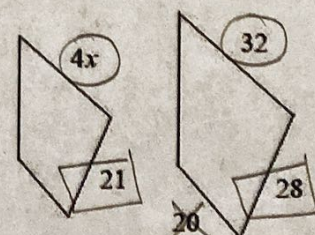
1.  $x = 11$

$\frac{15}{x-2} = \frac{25}{15}$   
 $25(x-2) = 15(15)$   
 $25x - 50 = 225$   
 $25x = 275$   
 $x = 11$



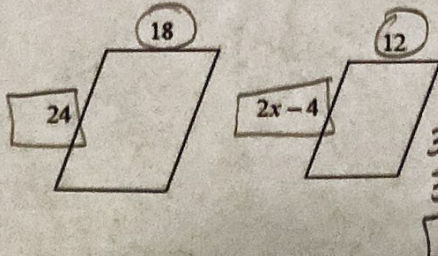
2.  $x = 6$

$\frac{21}{28} = \frac{4x}{32}$   
 $28(4x) = 21(32)$   
 $112x = 672$   
 $x = 6$



3.  $x = 10$

$\frac{18}{12} = \frac{24}{2x-4}$   
 $18(2x-4) = 12(24)$   
 $36x - 72 = 288$   
 $36x = 360$   
 $x = 10$



4.  $x = 6$

$\frac{20}{5} = \frac{5x-2}{7}$   
 $5(5x-2) = 20(7)$   
 $25x - 10 = 140$   
 $25x = 150$   
 $x = 6$

