

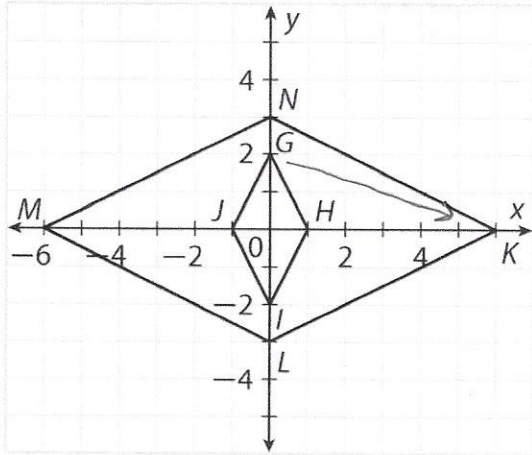
**LESSON**  
**11-2**

**Proving Figures are Similar Using Transformations**

*Practice and Problem Solving: A/B*

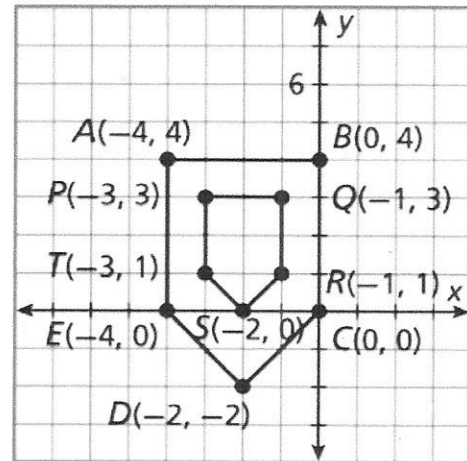
For Problems 1–2, prove that the figures are similar by describing (in words) a sequence of transformations that maps the first figure to the second.

1. *GHIJ* and *KLMN*



Rotate  $90^\circ$  CW  
Dilate by scale factor of 3

2. *ABCDE* and *PQRST*



Dilate scale of  $\frac{1}{2}$   
Translate left 1, up 1

For Problem 3-4 plot each polygon on the grid. Show that the polygons are similar by describing transformations that map the first polygon to the second.

3.  $A(-6, 3), B(-3, 9), C(3, 6)$   
 $G(-2, 1), H(-1, 3), J(1, 2)$

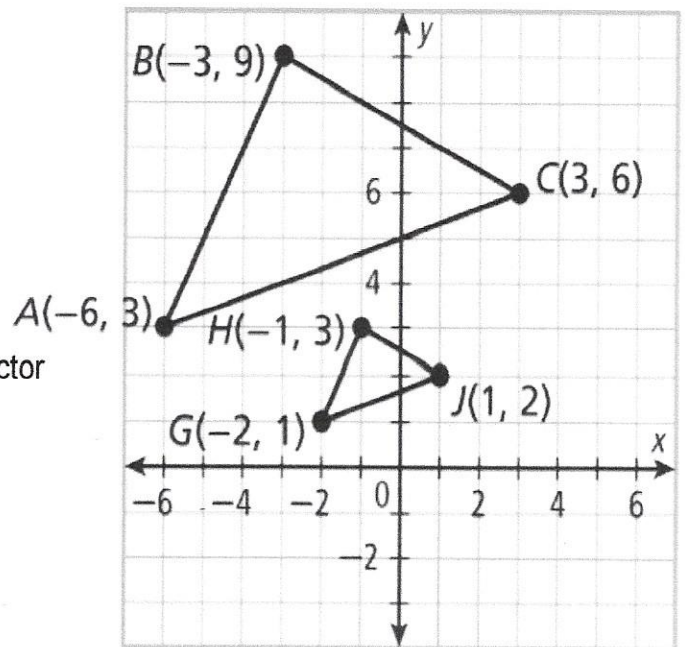
Each coordinate of  $\triangle ABC$  can be multiplied by  $\frac{1}{3}$  to give the corresponding coordinate

of  $\triangle GHJ$ . The transformation of  $\triangle ABC$

to  $\triangle GHJ$  is a dilation with a scale factor

of  $\frac{1}{3}$ .

Therefore the triangles are similar.



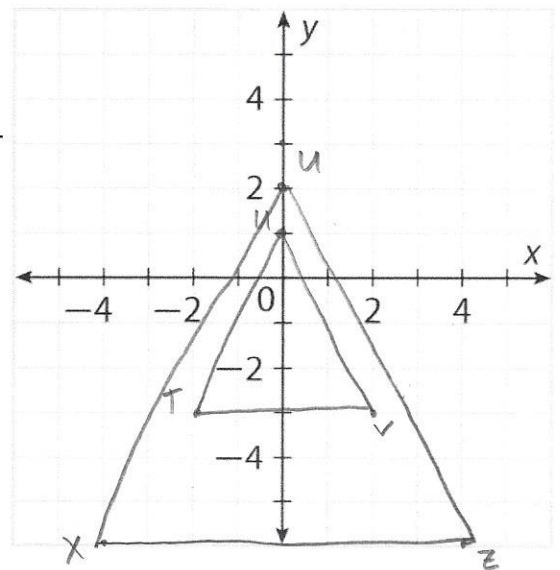
4.  $T(-2, -3)$ ,  $U(0, 1)$ ,  $V(2, -3)$   
 $X(-4, -6)$ ,  $Y(0, 2)$ ,  $Z(4, -6)$

Each coordinate of  $\triangle TUV$  can be multiplied by 2

to give the corresponding coordinate of  $\triangle XYZ$ .

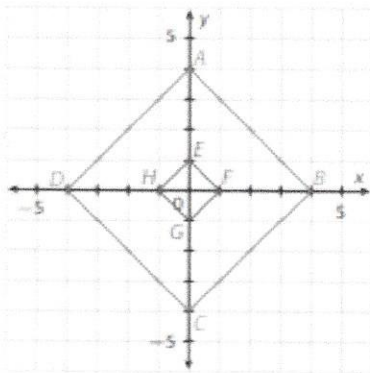
The transformation of  $\triangle TUV$  to  $\triangle XYZ$  is a dilation with a scale factor of 2.

Therefore the triangles are similar.



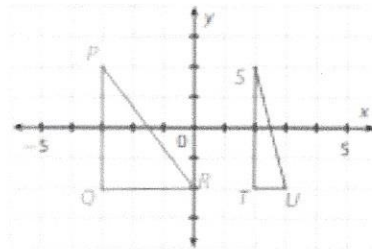
For Problems 1-4, determine if the figures are similar. If they are, describe (in words) the sequence of transformations that maps one figure to the other.

1. EFGH and ABCD



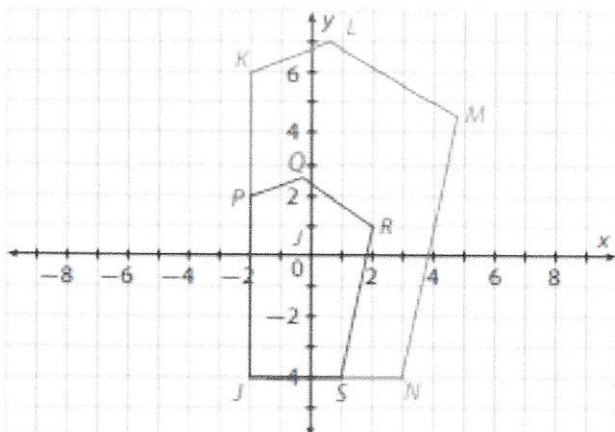
similar  
 dilate, scale factor 4

2.  $\triangle PQR$  and  $\triangle STU$



not similar

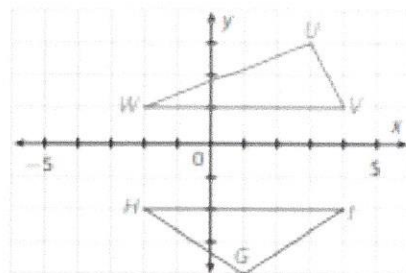
3. JKLMN and JPQRS



$(3, -4) \rightarrow (1.8, -2.4) \rightarrow (1, -4)$

similar; dilate, scale factor  $\frac{3}{5}$   
 translate left .8, down 1.6

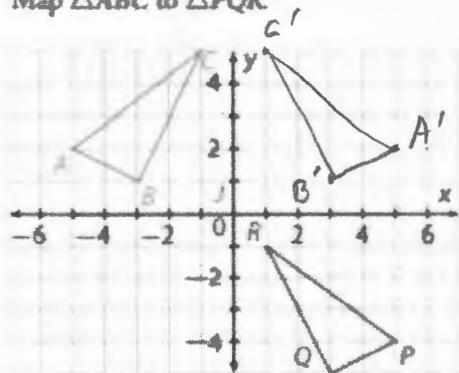
4.  $\triangle UVW$  and  $\triangle GHI$



not similar

For Problems 5-8, show that the figures are similar by writing the coordinate notation for the sequence of transformations that maps one figure to the other.

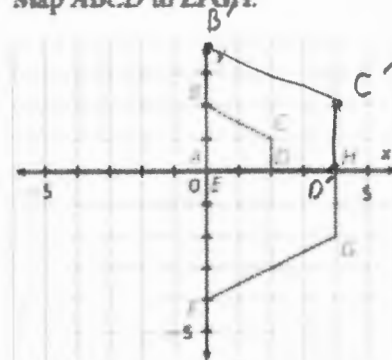
5. Map  $\triangle ABC$  to  $\triangle PQR$ .



reflect  
y-axis  
 $(x, y) \rightarrow (-x, y)$

translate  
 $\langle 0, -6 \rangle$   
 $\rightarrow (x, y - 6)$

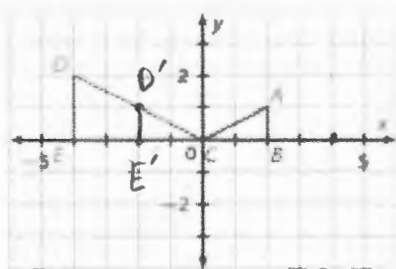
6. Map  $ABCD$  to  $EFGH$ .



dilate  
scale 2  
 $(x, y) \rightarrow (2x, 2y)$

reflect  
x-axis  
 $\rightarrow (x, -y)$

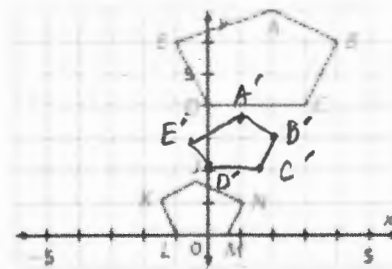
7. Map  $\triangle CED$  to  $\triangle CBA$ .



dilate  
scale  $\frac{1}{2}$   
 $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

reflect  
y-axis  
 $\rightarrow (-x, y)$

8. Map  $ABCDE$  to  $JKLMN$ .



dilate  
scale  $\frac{1}{2}$   
 $(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

reflect  
y-axis  
 $\rightarrow (-x, y)$

translate  
 $\langle \frac{1}{2}, -2 \rangle$   
 $\rightarrow (x + \frac{1}{2}, y - 2)$

18. Which of the following is a dilation?

- A.  $(x, y) \rightarrow (x, 3y)$
- B.  $(x, y) \rightarrow (3x, -y)$
- C.  $(x, y) \rightarrow (3x, 3y)$
- D.  $(x, y) \rightarrow (x, y - 3)$
- E.  $(x, y) \rightarrow (x - 3, y - 3)$

19. What is not preserved under dilation? Select all that apply.

- A. Angle measure
- B. Betweenness
- C. Collinearity
- D. Distance
- E. Proportionality