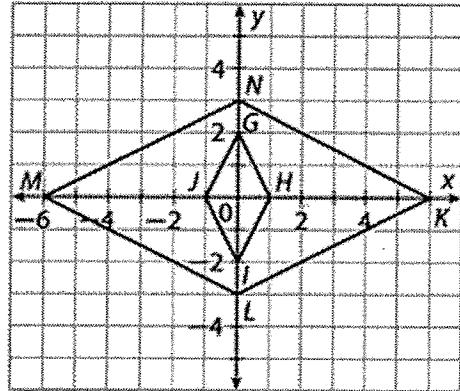


KEY

Chapter Review Packet #2

1. Prove that the two figures are similar by finding a sequence of transformations that maps one onto the other. State the sequence. Be sure to write each transformation in coordinate notation.

GHIJ and KLMN



(x, y)	$(y, -x)$	$(3x, 3y)$
$G(0, 2)$	$G'(2, 0)$	$K(-6, 0)$
$H(1, 0)$	$H'(0, -1)$	$L(-4, -4)$
$I(0, -2)$	$I'(-2, 0)$	$M(-6, -2)$
$J(-1, 0)$	$J'(0, 1)$	$N(0, 3)$

→ See next page
for graph

(1) Rotate $GHIJ$ 270° counterclockwise about the origin.

(2) Then $(x, y) \rightarrow (y, -x)$

(2) Dilate $G'H'I'J'$ by a scale factor of 3.

$(x, y) \rightarrow (3x, 3y)$

Determine whether or not these triangles are similar by finding the ratios of the lengths of corresponding sides.

2.

- a. $A(-6, 5), B(-4.5, 2), C(0, 5)$ and $D(1, 2), E(2, 4), F(5, 2)$
 b. $A(1, 1), B(1, 4), C(6, 1)$ and $D(-4, -4), E(-4, 0), F(3, -4)$
 c. $A(-5, -1), B(-2, 5), C(1, -1)$ and $D(2, -4), E(3, -2), F(4, -4)$

Similar

Not Similar

Similar

Space for work:

$$a) \frac{AB}{DE} = \frac{\sqrt{11.25}}{\sqrt{5}} = 1.5$$

$$\frac{BC}{EF} = \frac{\sqrt{29.25}}{\sqrt{13}} = 1.5$$

$$\frac{AC}{DF} = \frac{6}{7} = 1.5$$

$$b) \frac{AB}{DE} = \frac{3}{4}$$

$$\frac{AC}{DF} = \frac{5}{7}$$

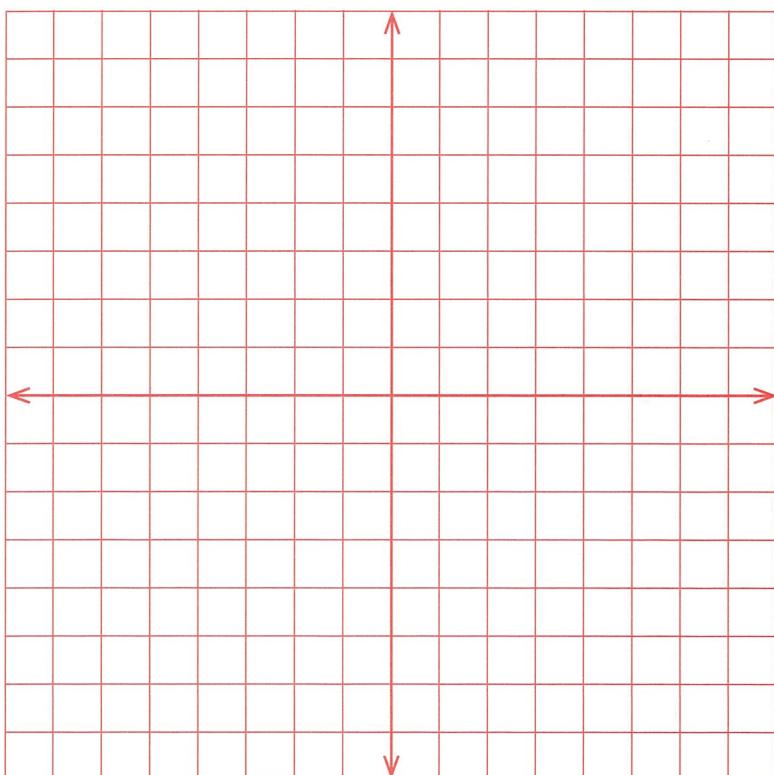
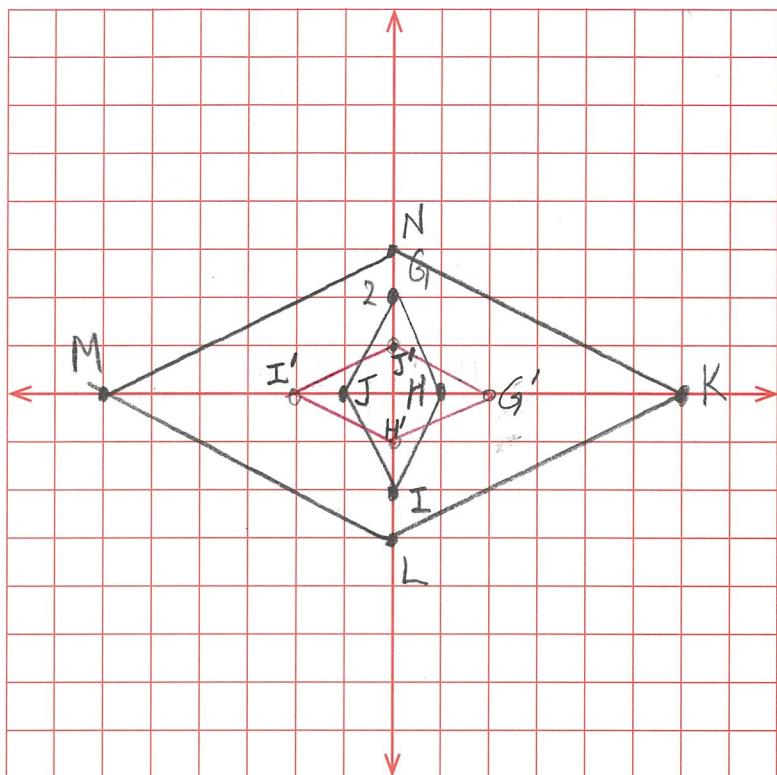
$$\frac{3}{4} \neq \frac{5}{7}$$

$$c) \frac{AB}{DE} = \frac{\sqrt{45}}{\sqrt{5}} = 3$$

$$\frac{BC}{EF} = \frac{\sqrt{45}}{\sqrt{13}} = 3$$

$$\frac{AC}{DF} = \frac{6}{7} = 3$$

#1



3. Apply the dilation D to the polygon with the given vertices. State the coordinates of the image points. Plot the preimage and image. State the scale factor.

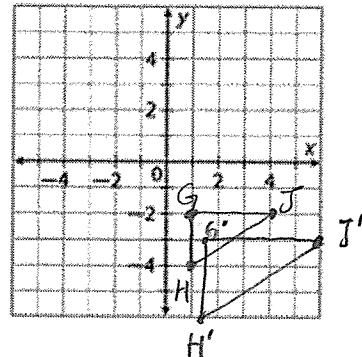
a)

$$D(x, y) \rightarrow (1.5x, 1.5y)$$

$$G(1, -2), H(1, -4), J(4, -2)$$

$$G'(1.5, -3), H'(1.5, -6), J'(6, -3)$$

$$\text{Scale factor: } 1.5$$



If you drew lines $\overline{GG'}$, $\overline{HH'}$, and $\overline{JJ'}$, on the graph for Problem 1,

where would the lines intersect? $(0, 0)$ This point is called the center of dilation.

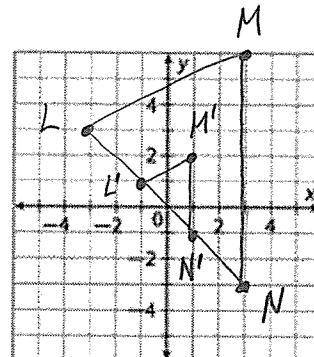
b)

$$D(x, y) \rightarrow \left(\frac{1}{3}x, \frac{1}{3}y\right)$$

$$L(-3, 3), M(3, 6), N(3, -3)$$

$$L'(-1, 1), M'(1, 2), N'(1, -1)$$

$$\text{Scale factor: } \frac{1}{3}$$



If you drew lines $\overline{LL'}$, $\overline{MM'}$, and $\overline{NN'}$ on the graph for Problem 2,

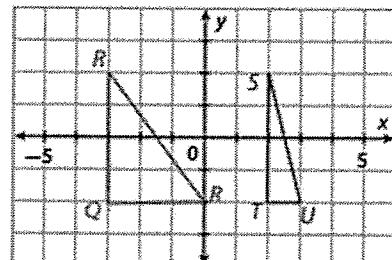
where would the lines intersect? $(0, 0)$

4. Determine if the two figures are similar using similarity transformations. Explain.

$\triangle PQR$ and $\triangle STU$

$$\frac{PQ}{QR} = \frac{1}{3} \quad \frac{ST}{RG} = \frac{4}{4} = 1 \quad \frac{1}{3} \neq 1$$

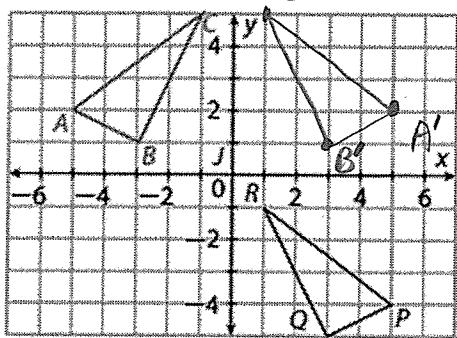
The ratios of the lengths of corresp. sides are not equal. \therefore There is no similarity transformation that maps $\triangle PQR$ onto $\triangle STU$; therefore, they are not similar.



For #5-7, find a sequence of similarity transformations that maps one figure to the other. Provide the coordinate notation for each transformation.

5.

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



(x, y)	$(-x, y)$	$(x, y-6)$
A(-5, 2)	A' (5, 2)	P (5, -4)
B(-3, 1)	B' (3, 1)	Q (3, -5)
C(-1, 5)	C' (1, 5)	R (1, -1)

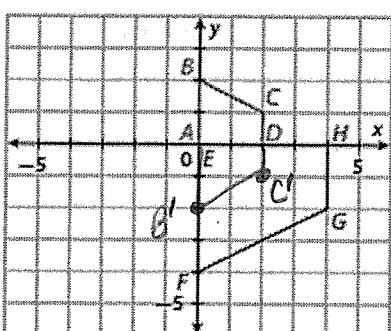
You can map $\triangle ABC$ to $\triangle PQR$ by a reflection followed by a translation.

Reflection: $(x, y) \rightarrow (-x, y)$

Translation: $(x, y) \rightarrow (x, y-6)$

6.

Map $ABCD$ to $EFGH$.



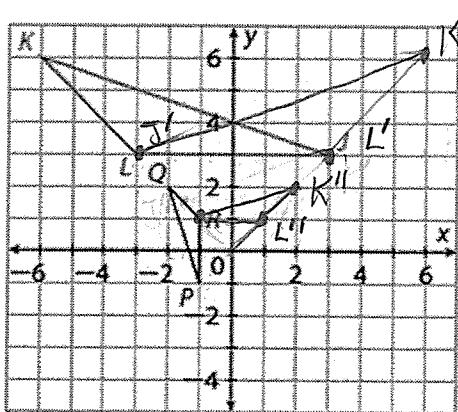
Can map $ABCD$ to $EFGH$ ① by a reflection and ② by a dilation.

Reflection: $(x, y) \rightarrow (x, -y)$

Dilation: $(x, y) \rightarrow (2x, 2y)$

7.

Map $\triangle JKL$ to $\triangle PQR$.



(x, y)	$(-x, y)$	$(\frac{1}{3}x, \frac{1}{3}y)$	$(-x, -y)$
J(3, 3)	J'(-3, 3)	J''(-1, 1)	P(-1, -1)
K(-6, 6)	K' (6, 6)	K''(2, 2)	Q(-2, 2)
L(-3, 3)	L'(3, 3)	L''(1, 1)	R(-1, 1)

Map by

① By a reflection $(x, y) \rightarrow (-x, y)$

② by a dilation $(x, y) \rightarrow (\frac{1}{3}x, \frac{1}{3}y)$

③ by a rotation 90° counterclockwise about the origin.

$$\frac{PR}{J'L'} = \frac{2}{6} = \frac{1}{3}$$

8.

Which transformations will not produce similar figures? Select all that apply and explain your choices.

- A. $(x, y) \rightarrow (x - 4, y) \rightarrow (-x, -y) \rightarrow (8x, 8y)$
- B. $(x, y) \rightarrow (x + 1, y + 1) \rightarrow (3x, 2y) \rightarrow (-x, -y)$
- C. $(x, y) \rightarrow (5x, 5y) \rightarrow (x, -y) \rightarrow (x + 3, y - 3)$
- D. $(x, y) \rightarrow (x, 2y) \rightarrow (x + 6, y - 2) \rightarrow (2x, y)$
- E. $(x, y) \rightarrow (x, 3y) \rightarrow (2x, y) \rightarrow (x - 3, y - 2)$

Choices B and E will not produce similar figures, b/c each sequence contains transformations that are not dilations or rigid motions.

Choice D contains 2 transformations that are not dilations or rigid motions, but together create a dilation.

9.

$\triangle CDE$ maps to $\triangle STU$ with the transformations

$$(x, y) \rightarrow (x - 2, y - 2) \rightarrow (3x, 3y) \rightarrow (x, -y).$$

If $CD = a + 1$, $DE = 2a - 1$, $ST = 2b + 3$, and $TU = b + 6$, find the values of a and b .

Lengths of $\triangle STU$ are 3K lengths of $\triangle CDE$.

$$3(a+1) = 2b+3 \quad a=2, b=3$$

$$3(2a-1) = b+6$$

$(a+1), (2a-1), (2b+3)$, and $(b+6)$ represent lengths, not coordinates!

Figure CDEF is similar to figure KLMN. Which statements are false? Select all that apply and explain why.

- A. $\frac{CD}{KL} = \frac{EF}{MN}$
- B. $\frac{CF}{KN} = \frac{EF}{MN}$
- C. $\frac{DE}{LM} = \frac{CF}{KN}$
- D. $\frac{LM}{DE} = \frac{KL}{CD}$
- E. $\frac{LM}{DE} = \frac{KN}{CD}$

B is false. Corresp. sides are not matched up.

11. Extra practice for 12.2: Do hw section problems: #2-12, evens.

See 12.2 hw key for answers.