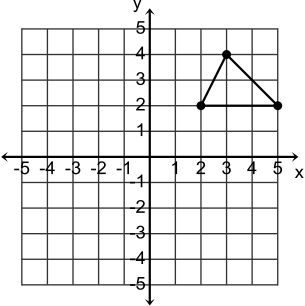
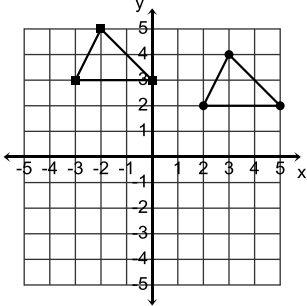


**Notes: T2-23 Transformations**

Use the vertices and graphs to understand the rules and transformations for each new triangle compared with the original triangle,  $\triangle ABC$ .

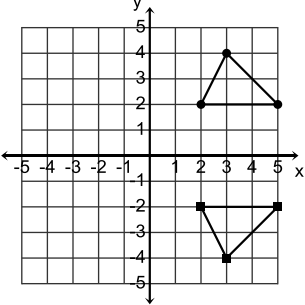
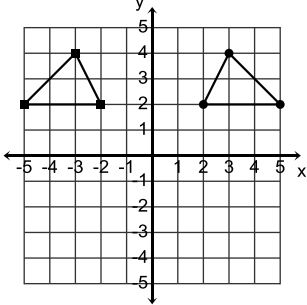
Original Triangle  $\triangle ABC$

$\triangle DEF$

<p><u>Vertices</u>                  A (2, 2)                  B (3, 4)                  C (5, 2)</p>  <p>Rule: <math>(x, y)</math></p>	<p><u>Vertices</u>                  D (-3, 3)                  E (-2, 5)                  F (0, 3)</p>  <p>Rule: <math>(x - 5, y + 1)</math>                  Transformation: translate left 5 spaces and up 1</p>
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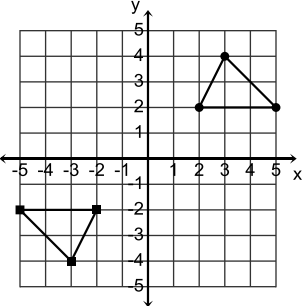
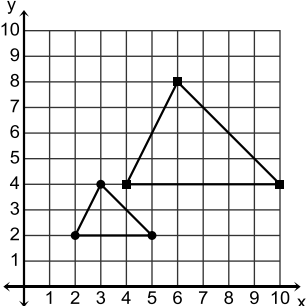
$\triangle GHI$

$\triangle JKL$

<p><u>Vertices</u>                  G (2, -2)                  H (3, -4)                  I (5, -2)</p>  <p>Rule: <math>(x, -y)</math>                  Transformation: reflection over the x-axis</p>	<p><u>Vertices</u>                  J (-2, 2)                  K (-3, 4)                  L (-5, 2)</p>  <p>Rule: <math>(-x, y)</math>                  Transformation: reflection over the y-axis</p>
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$\triangle MNO$

$\triangle PQR$

<p><u>Vertices</u>                  P (-2, -2)                  Q (-3, -4)                  R (-5, -2)</p>  <p>Rule: <math>(-x, -y)</math>                  Transformation: reflection over the x-axis and the y-axis.</p>	<p><u>Vertices</u>                  P (4, 4)                  Q (6, 8)                  R (10, 4)</p>  <p>Rule: <math>(2x, 2y)</math>                  Transformation: twice as wide and twice as tall</p>
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Describe the result of applying each transformation to a figure  $[A(x, y)]$  in the coordinate plane. Be specific with direction and distance.

Examples

Answers

1)  $G(x, y) = (x + 3, y - 9)$

Translate right 3 and down 9.

2)  $R(x, y) = (4x, 3y)$

Four times as wide and three times as tall.

3)  $L(x, y) = (-x, y)$

Reflection over the y-axis.

4)  $B(x, y) = (2x, -5y)$

Reflection over the x-axis, twice as wide, and five times as tall.

Write the original coordinates and the new coordinates and then write the rule for the transformation.

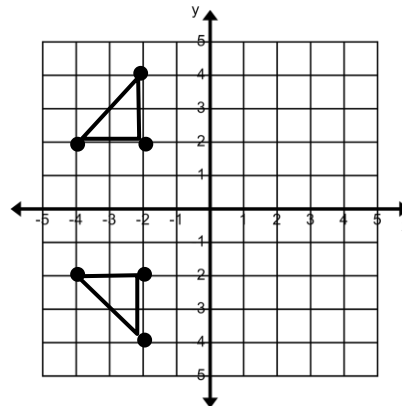
5)

Original Coordinates: ( , ) ( , ) ( , )

New Coordinates: ( , ) ( , ) ( , )

Rule: ( , )

Description: \_\_\_\_\_



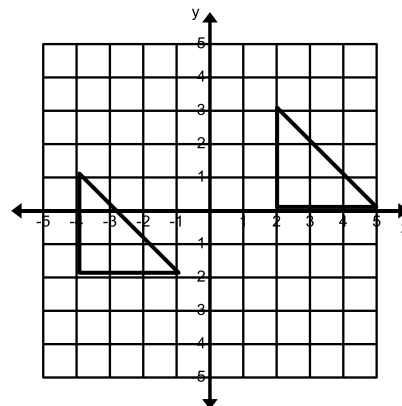
6)

Original Coordinates: ( , ) ( , ) ( , )

New Coordinates: ( , ) ( , ) ( , )

Rule: ( , )

Description: \_\_\_\_\_



**Assignment: T2-23 Transformations**

Describe the result of applying each transformation to a figure  $[A(x, y)]$  in the coordinate plane. Be specific with direction and distance.

1.  $H(x, y) = (x - 2, y + 3)$

2.  $R(x, y) = (x + 3, -y)$

3.  $T(x, y) = (-x, -y)$

4.  $K(x, y) = \left(\frac{1}{2}x, 6y\right)$

5.  $D(x, y) = (x, y - 6)$

6.  $R(x, y) = (x - 4, y - 1)$

7.  $G(x, y) = (x, -y - 4)$

8.  $F(x, y) = (8x, 10y)$

Write the rule for each transformation described below for a given  $(x, y)$  coordinate.

9. translation 6 units right

10. translation 4 units down

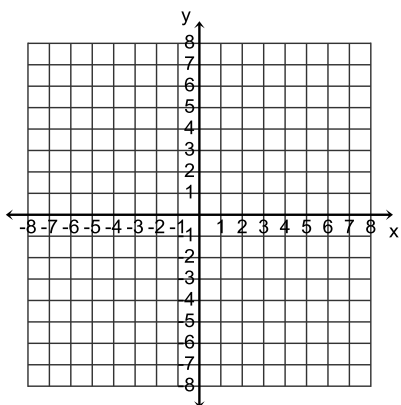
11. reflection across the  $x$ -axis and translated up 3 units

12. translation 9 units right and 8 units down

The coordinates of  $\triangle ABC$  are  $A(-2, 3)$ ,  $B(-3, 1)$ , and  $C(4, 2)$ . Plot the points and draw the triangle. Use the given rule to transform the figure. Write down the new vertices. Then describe the transformation.

13.  $\triangle DEF$

Vertices

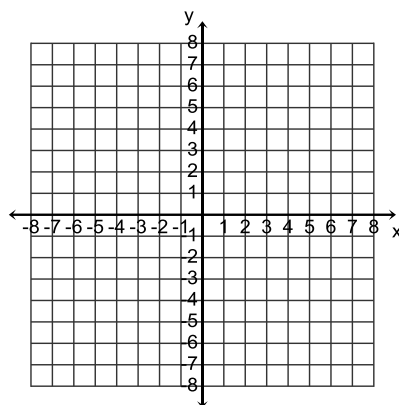


Rule:  $(2x, y)$

Transformation

14.  $\triangle GHI$

Vertices

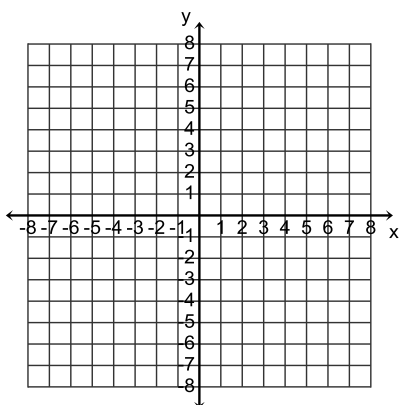


Rule:  $(x, -y)$

Transformation:

15.  $\triangle JKL$

Vertices

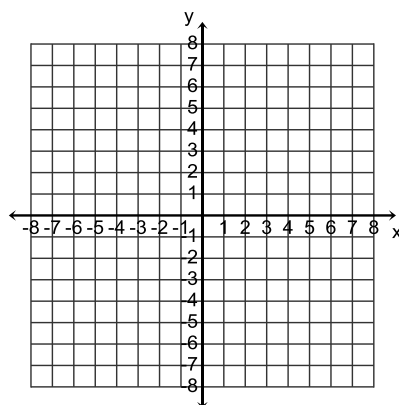


Rule:  $(x+3, y-2)$

Transformation:

16.  $\triangle MNO$

Vertices



Rule:  $(x-2, y-1)$

Transformation: