**1.** Determine the equation of the line that passes through A(3,-2) and B(-1,-6). Write the equation in slope-intercept, point-slope, and standard forms.

**2.** Determine the equation of the line that passes through the point B(4,-2) and has a slope of $\frac{2}{3}$. Write the equation in slope-intercept, point-slope, and standard forms.

**3.** Change the equation $y - 4 = \frac{1}{3}(x + 6)$ into slope-intercept form and standard form. Provide a sketch of the line.
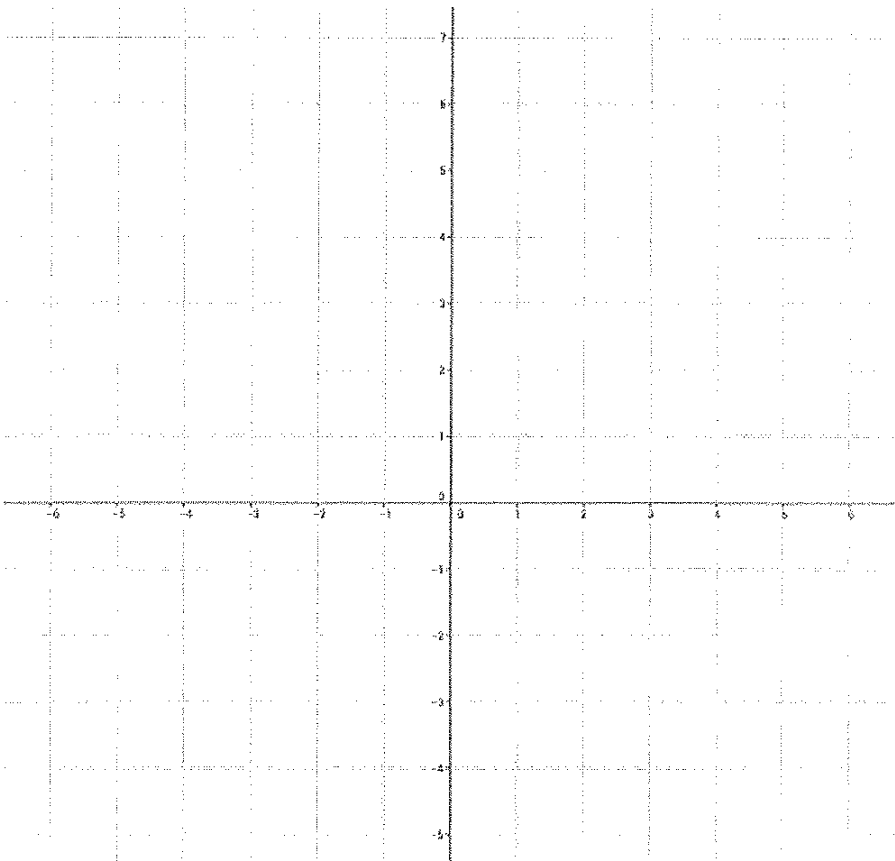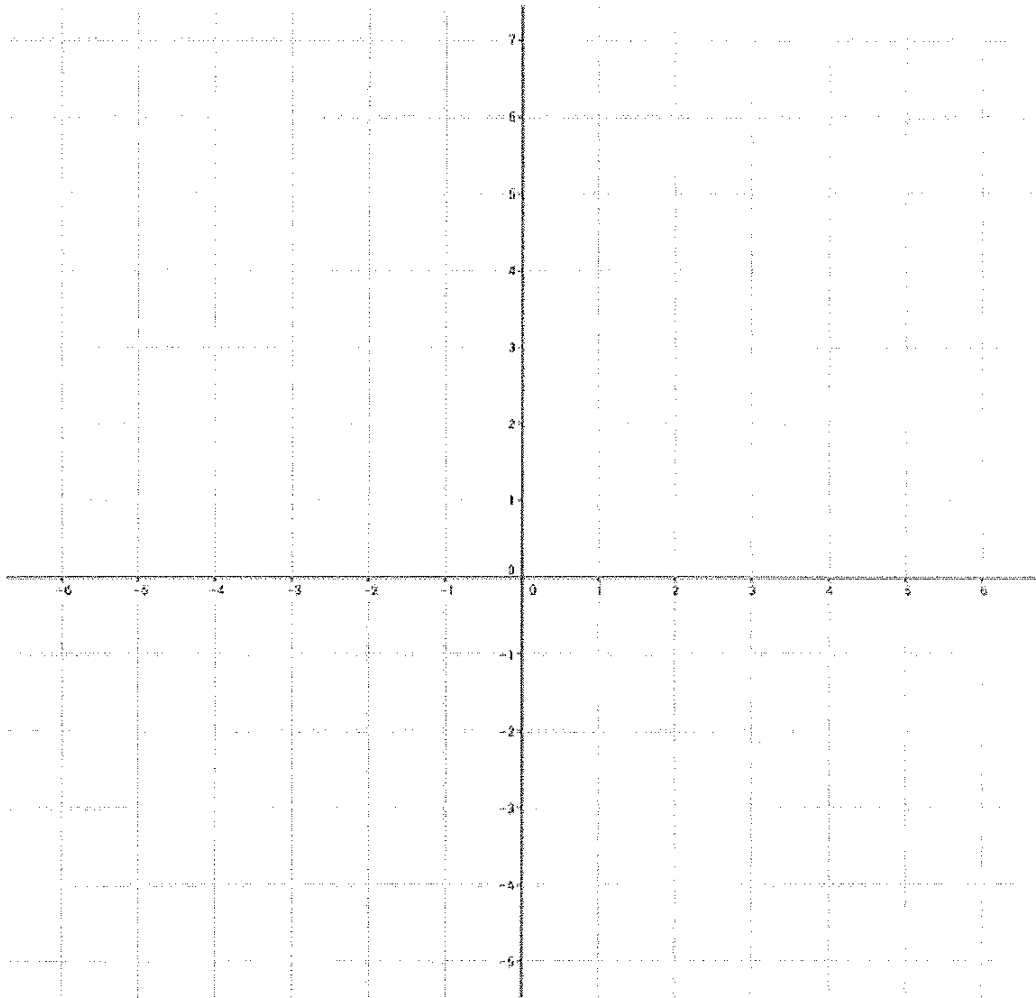
**4.** Change the equation $4x - 2y - 12 = 0$ into slope-intercept form and point-slope form. Provide a sketch of the line.
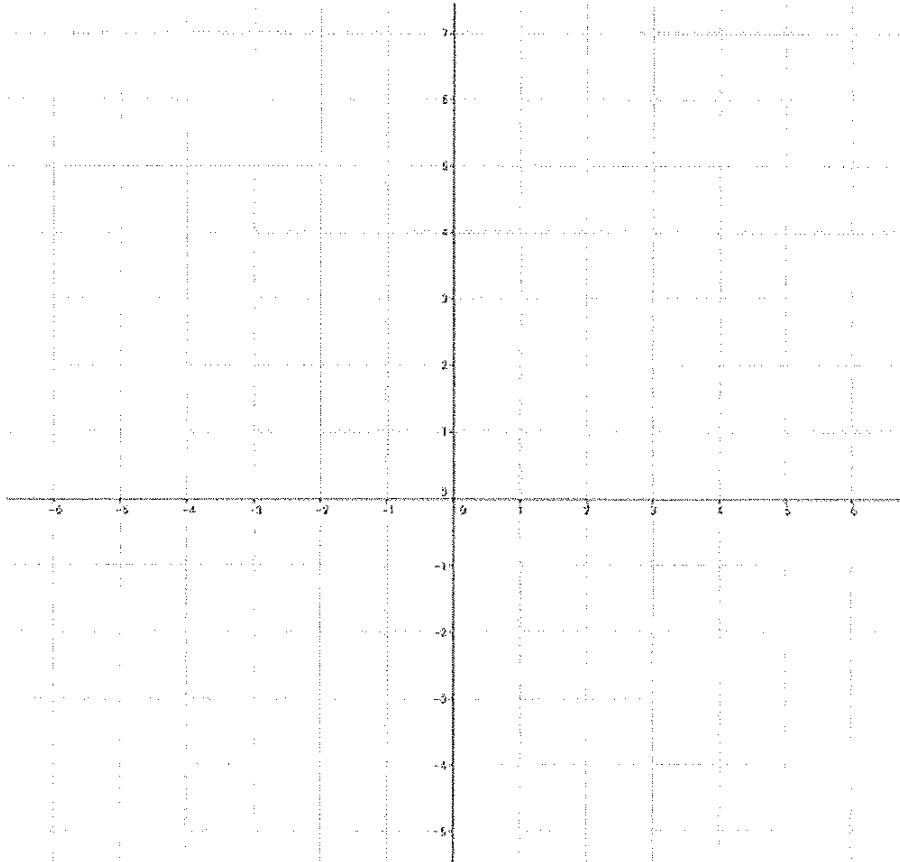
**5.** Sketch a graph of the system of linear equations $\begin{cases} 2x + 3y = 6 & \{-5 \le x \le 6\} \\ x - 2y = 8 & \{-5 \le x \le 6\} \end{cases}$

Does this system have a solution over the given domain? If so, find it.

**6.** Find values of $a$, b and $c$ so that the system $\begin{cases} 3x - 4y = 12 \\ ax + by = c \end{cases}$ has exactly one

solution. Explain how the graphs of the equations will be related.

**7.** Find values of $a$, b and $c$ so that the system $\begin{cases} 3x - 4y = 12 \\ ax + by = c \end{cases}$ has no solutions.

Explain how the graphs of the equations will be related.

**8.** Find values of $a$, b and $c$ so that the system $\begin{cases} 3x - 4y = 12 \\ ax + by = c \end{cases}$ has infinitely many

solution3. Explain how the graphs of the equations will be related.

**9.** Solve the system of linear equations.

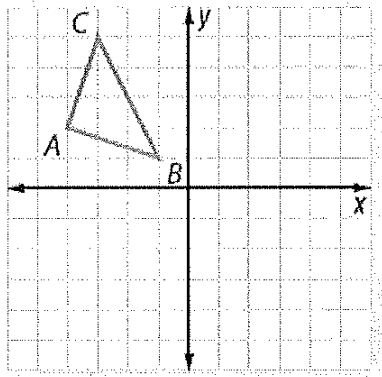a. $\begin{cases} 3x + y = 13 \\ x - 5y = 15 \end{cases}$

b. $\begin{cases} 6x - y = 14 \\ 2x + y = 12 \end{cases}$

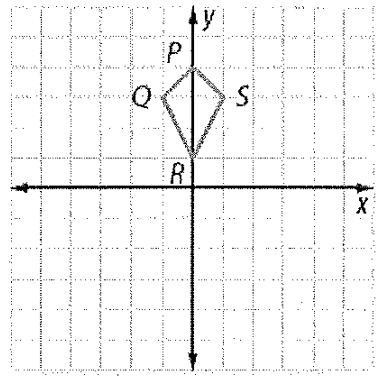c. $\begin{cases} 2x + y = -9 \\ 4x + 3y = 1 \end{cases}$

d. $\begin{cases} 3x - 4y = 22 \\ 2x + 5y = 7 \end{cases}$

**1.** Draw and label the transformed image according to the given rule. Identify as precisely as you can the type of transformation.
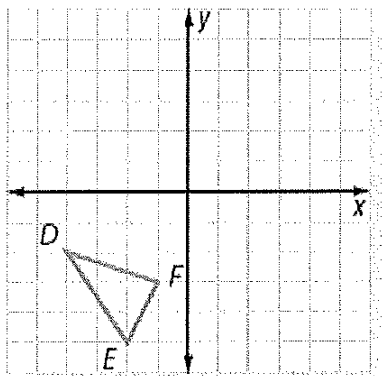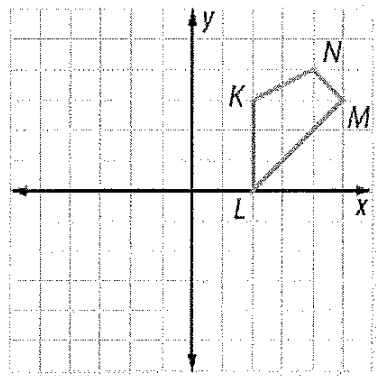
a. $(x, y) \rightarrow (x + 2, y - 3)$

b. $(x, y) \rightarrow (-y, x)$

c. $(x, y) \rightarrow (-x, y)$

d. $(x, y) \rightarrow (-x, -y)$

**2.** $\triangle ABC$ has vertices as follows: A(1, 2), B(4, 4), and C(3, 6).

    **a.** Draw $\triangle ABC$ on a coordinate grid. Then draw and label the image of $\triangle ABC$ under each of the following transformations:

        **i.** Translation by vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$.

**3.** $\triangle PQR$ has vertices as follows: P(3, -2), Q(6, -1), and R(4, 3).

    **a.** On separate coordinate grids, draw $\triangle PQR$ and its image under each of the following transformations. Label the vertices of the images.

        **i.**      Rotation of 90° counterclockwise about the origin.

        **ii.**     Rotation of 90° clockwise about the origin.

**4.** Quadrilateral $ABCD$ has vertices as follows: A(1, -1), B(2, 2), C(6, 2), and D(5, -1).

    **a.** On separate coordinate grids, draw quadrilateral $ABCD$ and its image under each of the following transformations. Label the vertices of the images.

        **i.**      Reflection across the x-axis.

        **ii.**     Reflection across the line y = x.

        **iii.**    Reflection across the y-axis.

    **b.** What is the perimeter of quadrilateral $ABCD$? How do you know that each of the image parallelograms in Part **a** will have the same perimeter?

**5.** A line segment ends at the points $C(-2,0)$ and $D(4,-4)$. Determine the equation for the perpendicular bisector of line segment CD.

**6.** A line segment has an endpoint at $A(5,2)$ and midpoint at $M(9,-3)$. Determine the co-ordinates of the other endpoint.

**7.** Prove that the quadrilateral defined by the points $(2,8)$, $(-2,3)$, $(2,-2)$, and $(6,3)$ is a rhombus but not a square.