NAME _____ DATE _____

Sliding Right, Left, Up, Down, and Diagonally
Translations Using Geometric Figures

Vocabulary

Define each term in your own words.

1. transformation

2. translation

3. image

Problem Set

Determine the coordinates of the image following each given translation.

1. Triangle *ABC* with coordinates *A*(2, 4), *B*(3, 6), and *C*(5, 1) is translated 4 units horizontally.
   The coordinates of the image are *A′*(6, 4), *B′*(7, 6), and *C′*(9, 1).

2. Parallelogram *DEFG* with coordinates *D*(0, 2), *E*(1, 5), *F*(6, 5), and *G*(5, 2) is translated −7 units horizontally.

3. Trapezoid *HIJK* with coordinates *H*(−1, 3), *I*(−1, −3), *J*(−4, −1), and *K*(−4, 1) is translated 3 units vertically.

4. Square *LMNO* with coordinates *L*(−1, 7), *M*(3, 7), *N*(3, 3), and *O*(−1, 3) is translated −5 units vertically.

5. Triangle *PQR* with coordinates *P*(3, −4), *Q*(6, −1), and *R*(6, −6) is translated −3 units horizontally and 6 units vertically.

6. Triangle *STU* with coordinates *S*(0, 0), *T*(4, 4), and *U*(5, 0) is translated 10 units horizontally and −2 units vertically.

7. Rectangle *WXYZ* with coordinates *W*(−8, −1), *X*(−2, −1), *Y*(−2, −3), and *Z*(−8, −3) is translated 13 units horizontally.

8. Rhombus *ABCD* with coordinates *A*(7, 8), *B*(9, 5), *C*(7, 2), and *D*(5, 5) is translated −9 units vertically.

9. Triangle *DEF* with coordinates *D*(0, 12), *E*(−3, −7), and *F*(−5, 1) is translated −12 units horizontally and −8 units vertically.

10. Parallelogram *GHIJ* with coordinates *G*(0, 0), *H*(2, 8), *I*(8, 8), and *J*(6, 0) is translated −8 units horizontally and −8 units vertically.

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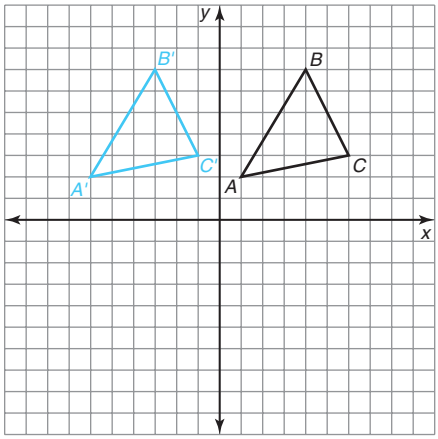
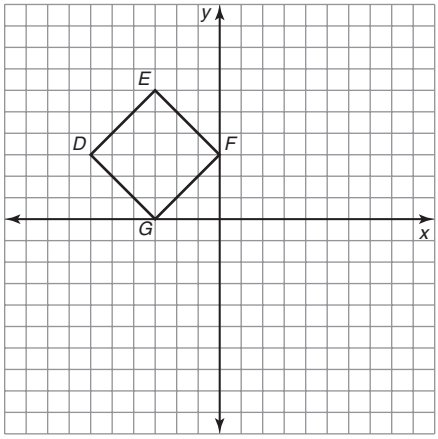
Sketch the translation of each given figure in the coordinate plane.

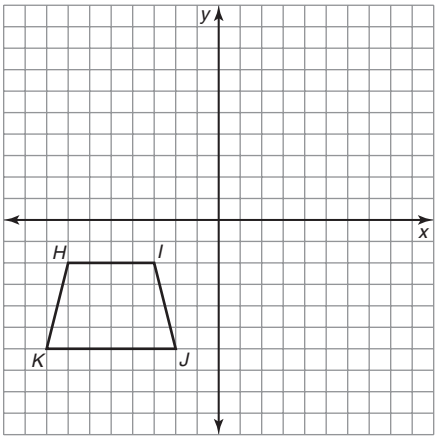
11. Translate the given figure −7 units horizontally.



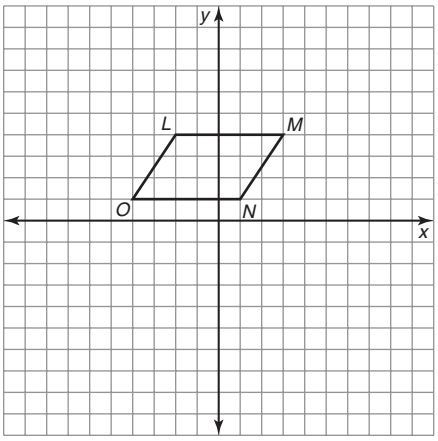
12. Translate the given figure 4 units horizontally.



13. Translate the given figure 8 units vertically.



14. Translate the given figure −6 units vertically.



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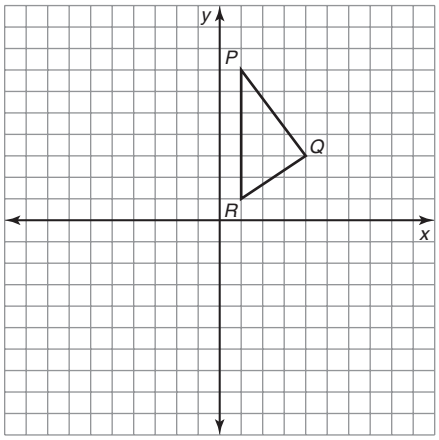
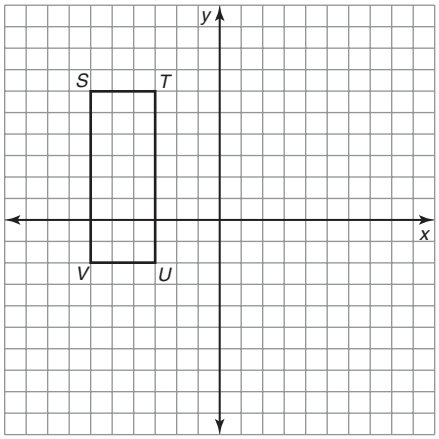
15. Translate the given figure 3 units horizontally and −8 units vertically.



16. Translate the given figure 9 units horizontally and −4 units vertically.



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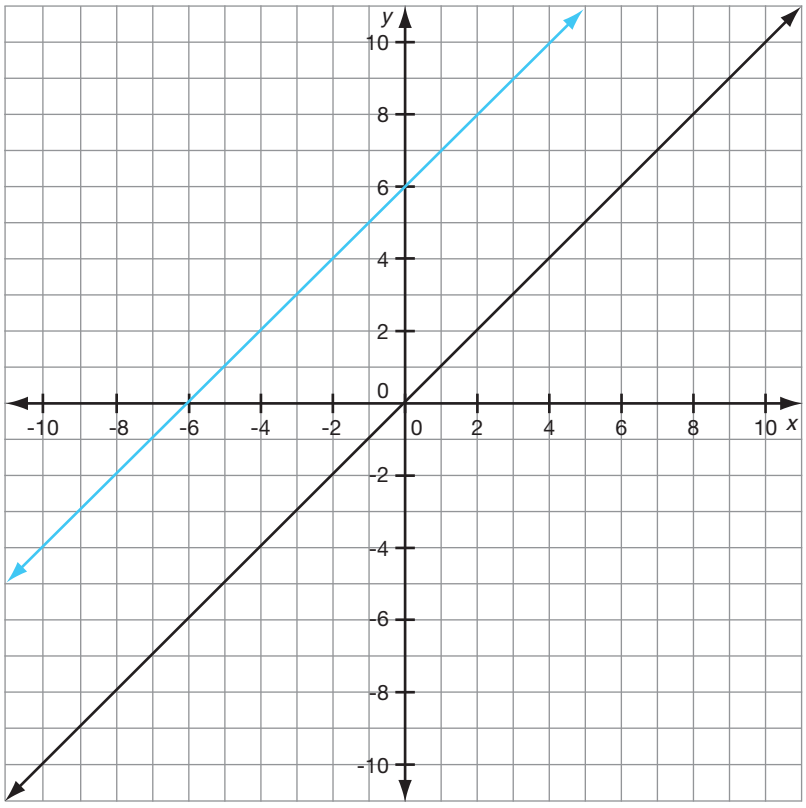
Sliding Lines
Translations of Linear Functions

Problem Set

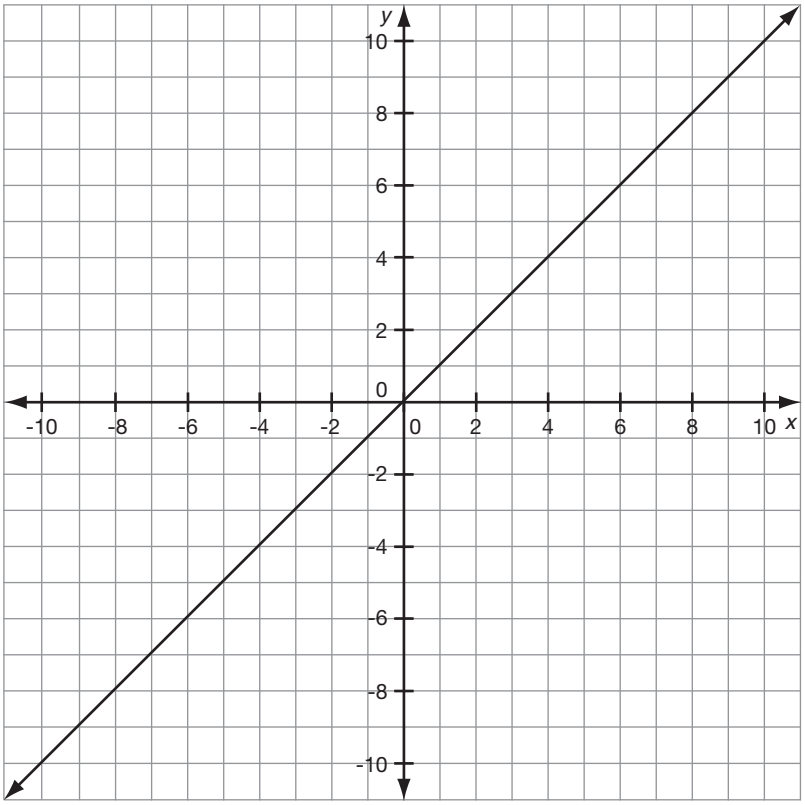
Translate each graph. Graph the translation and write an equation to represent the translation.

1. Translate the graph of $y = x$ up 6 units. Graph the translation and write an equation to represent the translation.



$y = x + 6$ or $x = y - 6$

2. Translate the graph of $y = x$ down 2 units. Graph the translation and write an equation to represent the translation.



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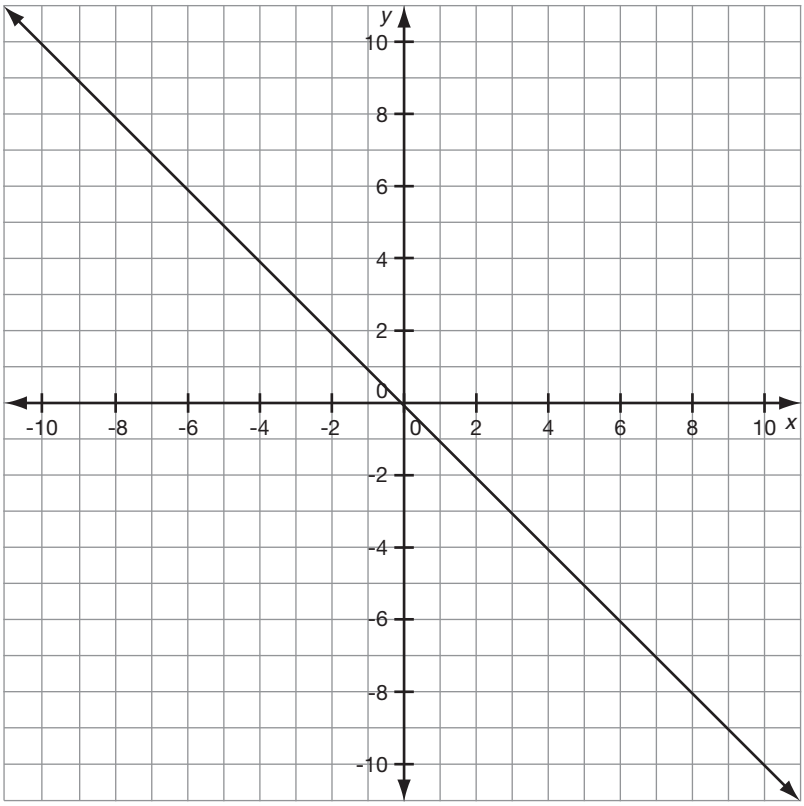
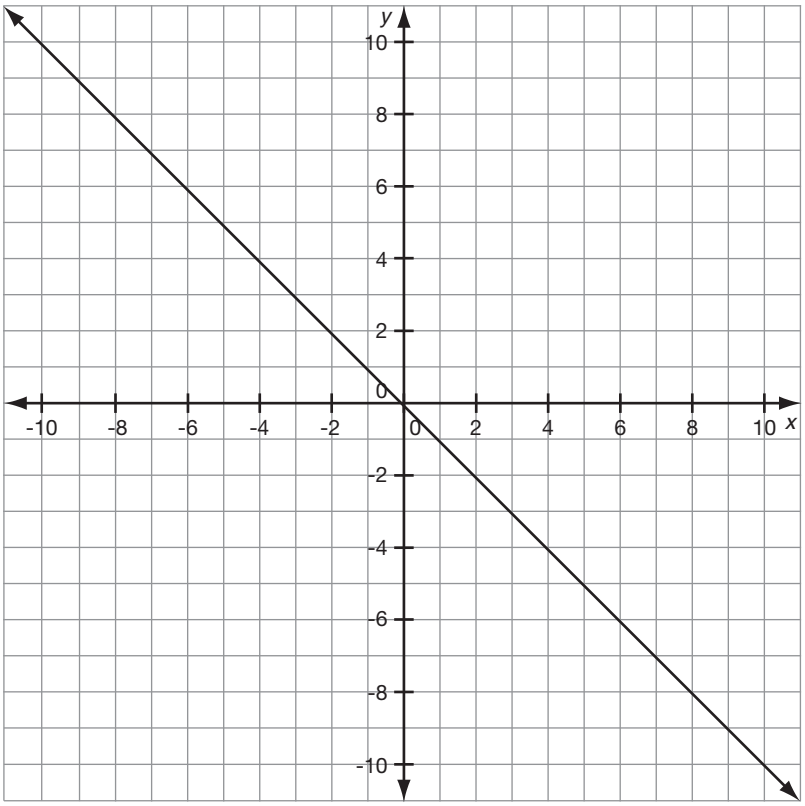
3. Translate the graph of $y = -x$ left 3 units. Graph the translation and write an equation to represent the translation.



4. Translate the graph of $y = -x$ right 2 units. Graph the translation and write an equation to represent the translation.



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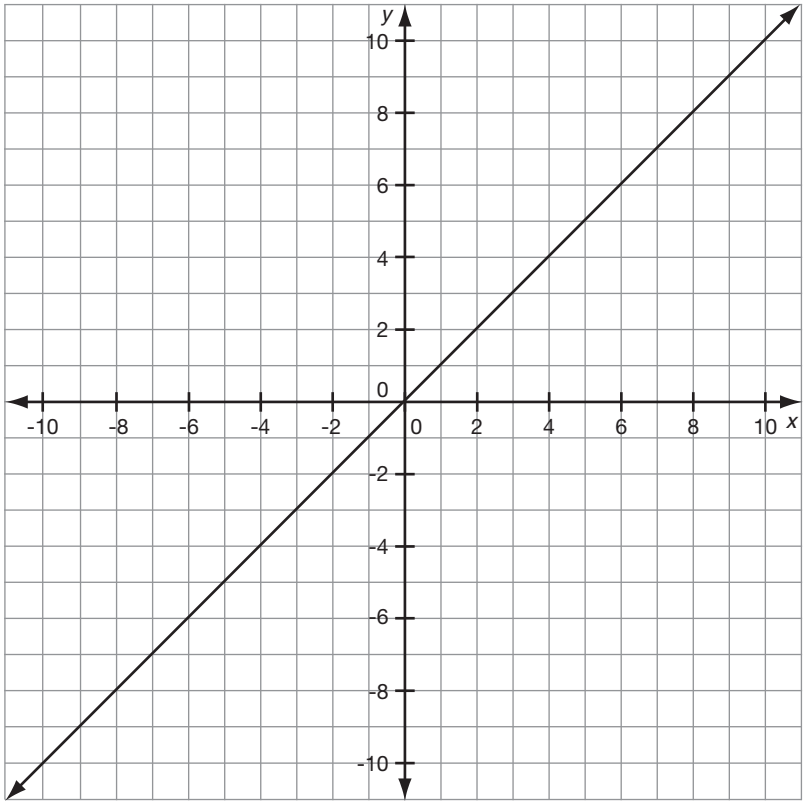
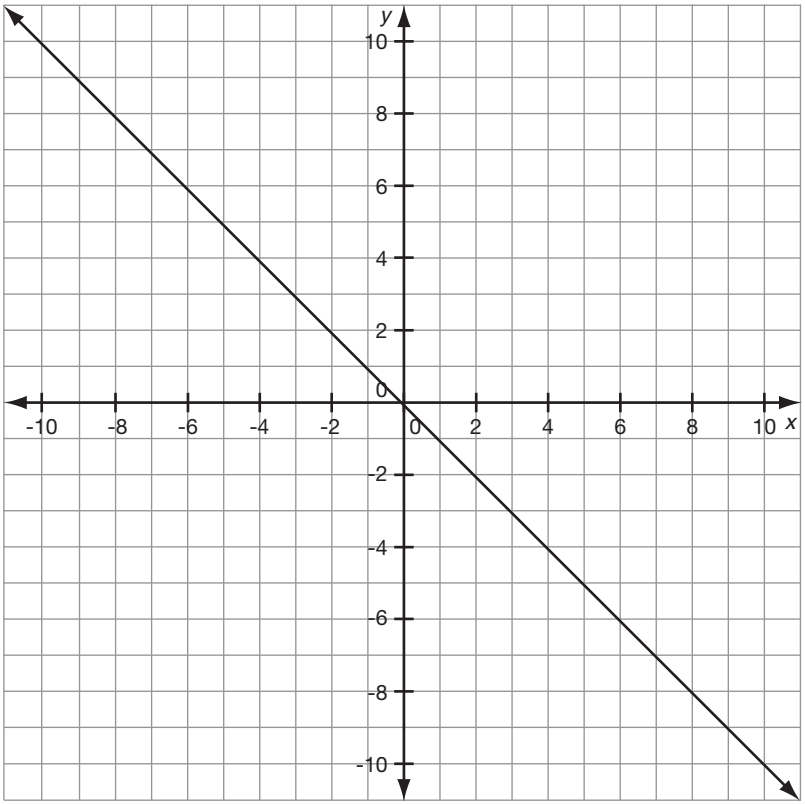
5. Translate the graph of $y = x$ left 5 units. Graph the translation and write an equation to represent the translation.



6. Translate the graph of $y = -x$ down 8 units. Graph the translation and write an equation to represent the translation.



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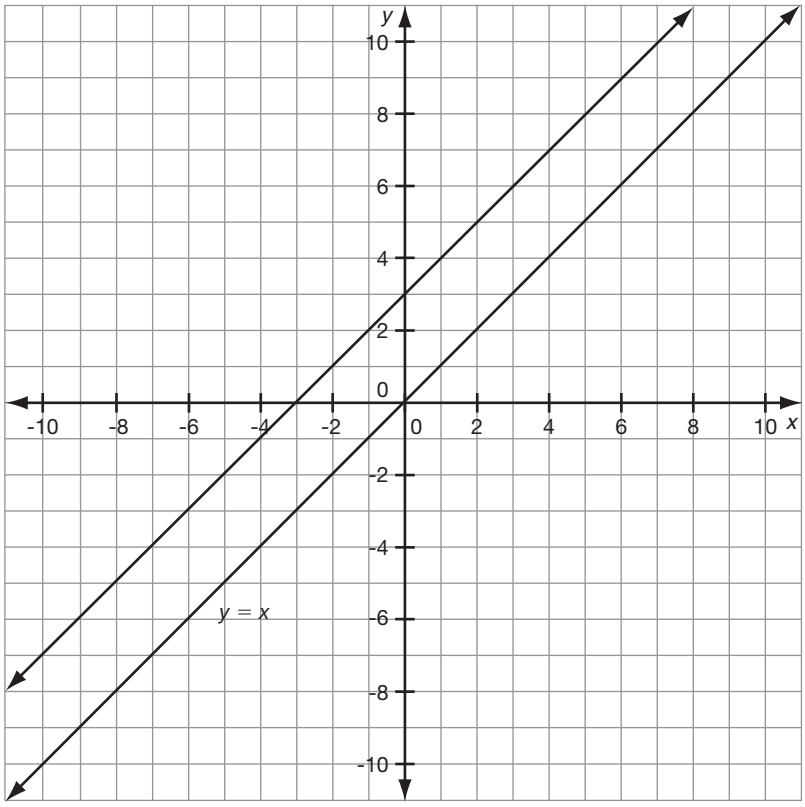
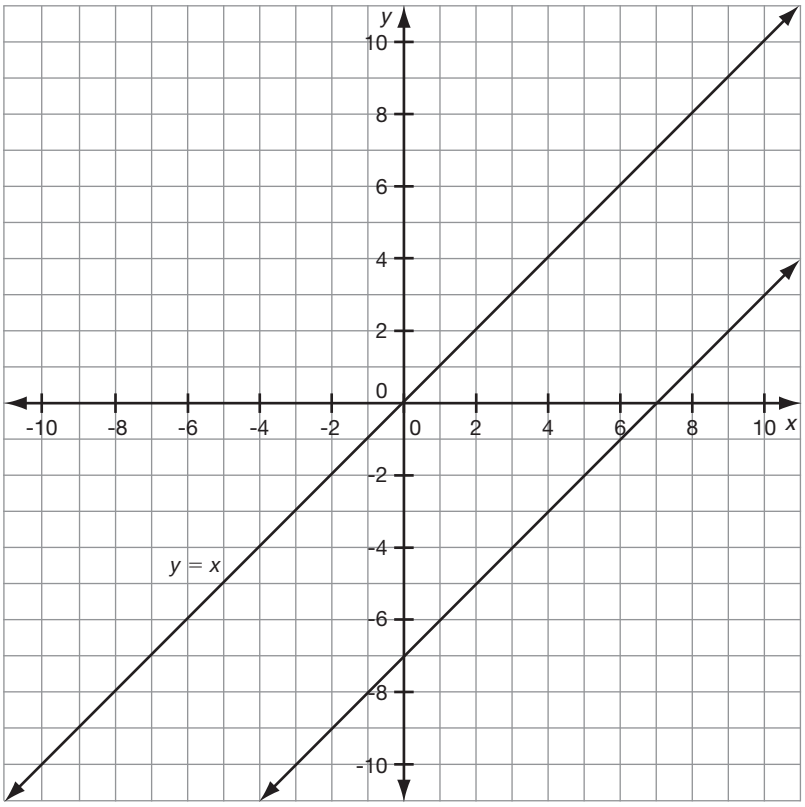
Describe each translation.

7. The graph shown is the result of a translation performed on the equation $y = x$.



The translation is either a slide up 3 units or a slide left 3 units.

8. The graph shown is the result of a translation performed on the equation $y = x$.



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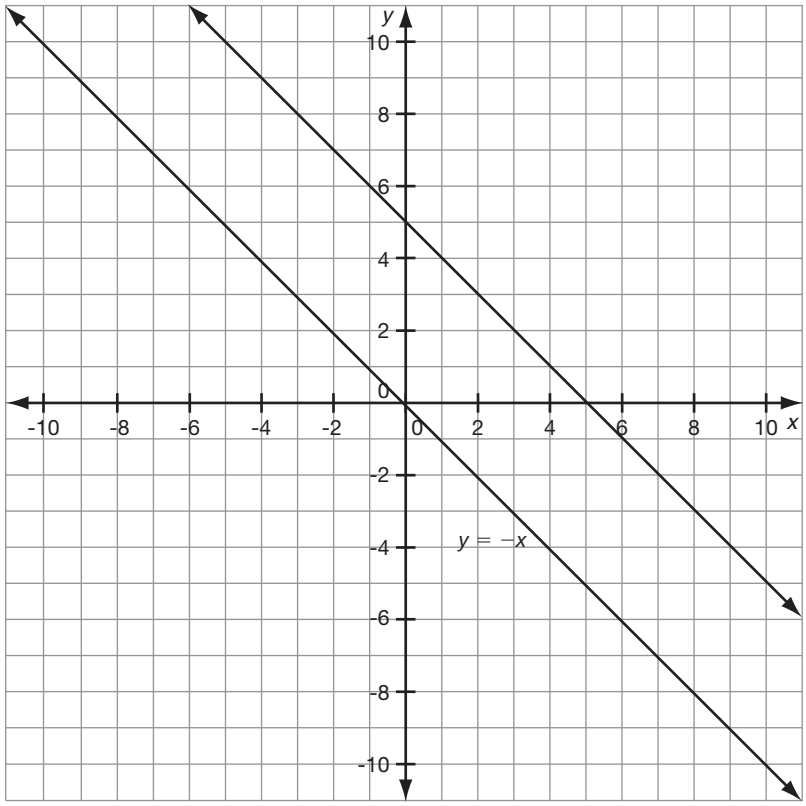
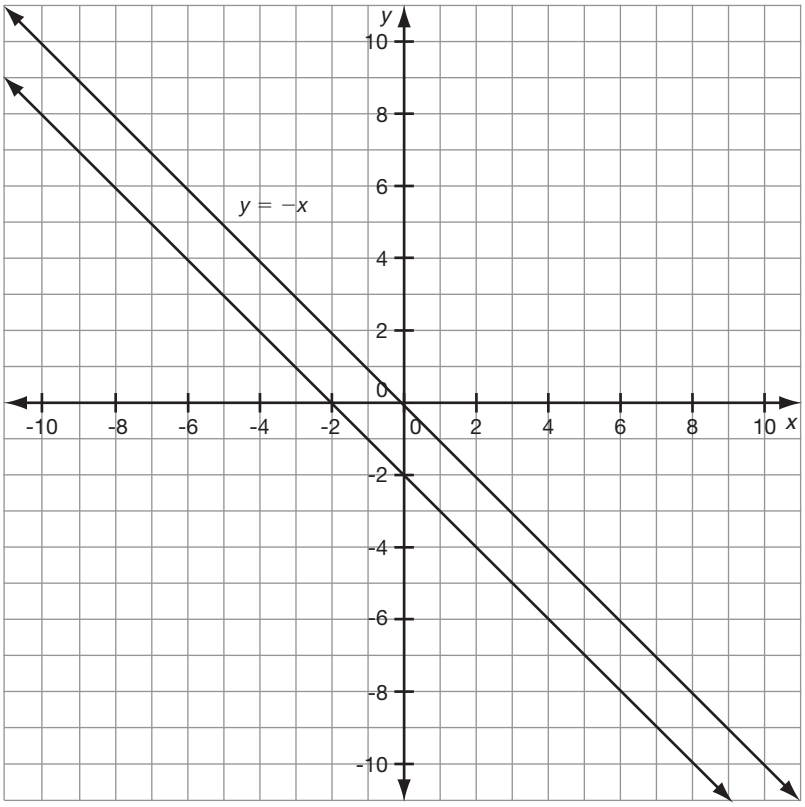
9. The graph shown is the result of a translation performed on the equation $y = -x$.



10. The graph shown is the result of a translation performed on the equation $y = -x$.



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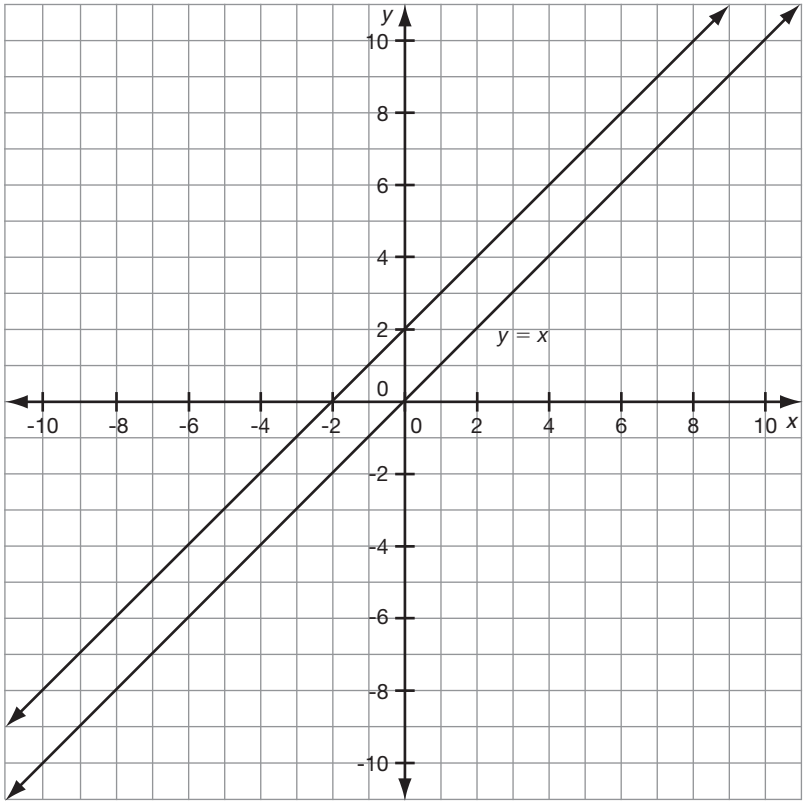
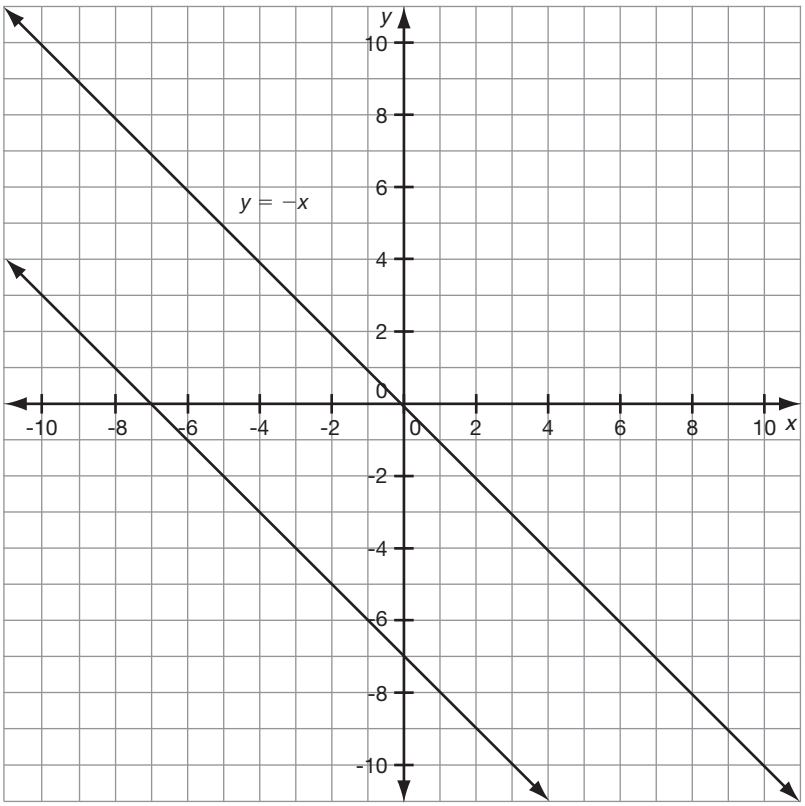
11. The graph shown is the result of a translation performed on the equation $y = x$.



12. The graph shown is the result of a translation performed on the equation $y = -x$.



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Describe each translation.

13. The equation $y = x + 4.5$ is the result of a translation performed on the equation $y = x$.

The translation is either a slide up 4.5 units or a slide left 4.5 units.

14. The equation $y = -x + 2.1$ is the result of a translation performed on the equation $y = -x$.

15. The equation $y = x + 6.2$ is the result of a translation performed on the equation $y = x$.

16. The equation $y = -x - 12$ is the result of a translation performed on the equation $y = -x$.

17. The equation $y = x - 3.8$ is the result of a translation performed on the equation $y = x$.

18. The equation $y = -x - 1.5$ is the result of a translation performed on the equation $y = -x$.

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Round and Round We Go!
Rotations of Geometric Figures on the Coordinate Plane

Vocabulary

Define each term in your own words.

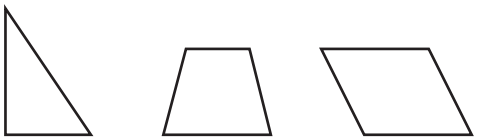
1. rotation

2. angle of rotation

3. point of rotation

Problem Set

Cut out the given triangle, trapezoid, and parallelogram. Rotate the given figure around each given point of rotation in the coordinate plane. Trace and label the rotated image.



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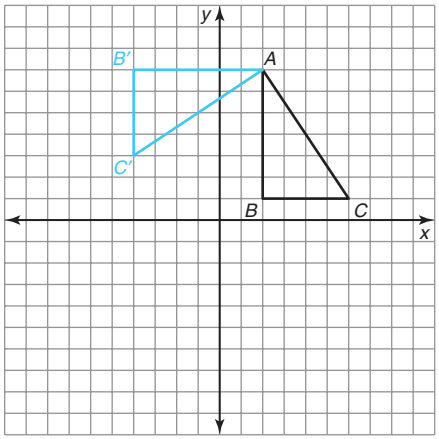
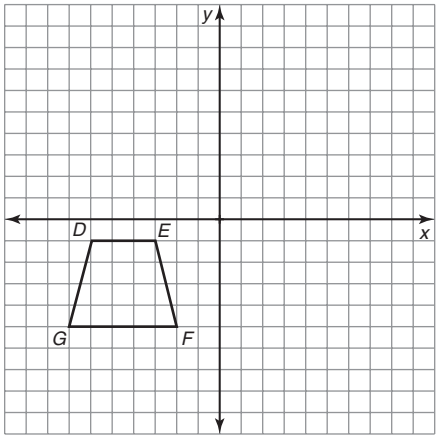
1. Rotate ΔABC around point A.

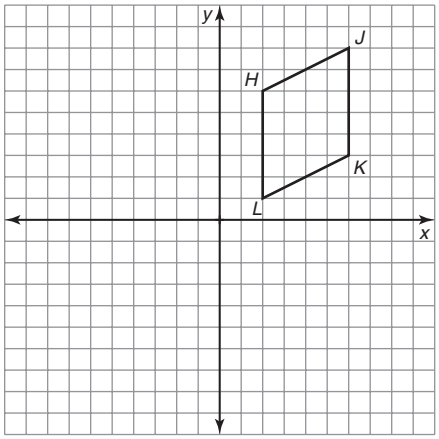


2. Rotate trapezoid $DEFG$ around point E.

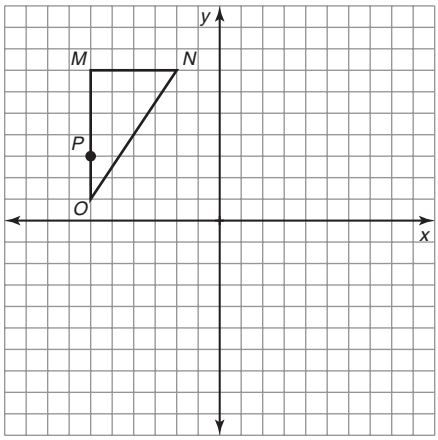


Answers may vary.

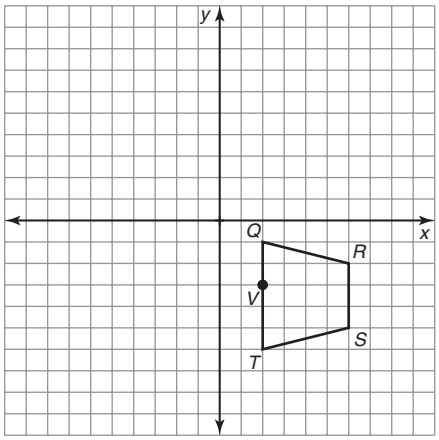
3. Rotate parallelogram $HJKL$ around point L.



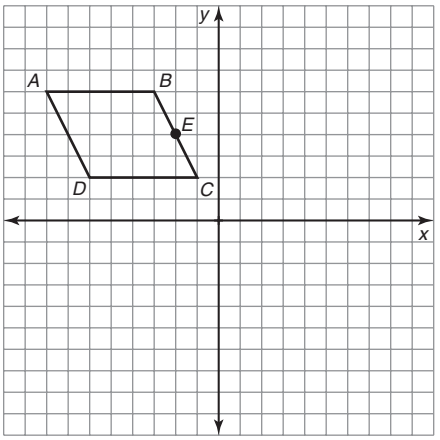
4. Rotate $\triangle MNO$ around point P.



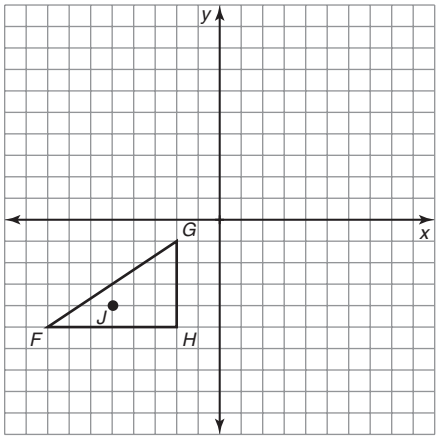
5. Rotate trapezoid *QRST* around point *V*.



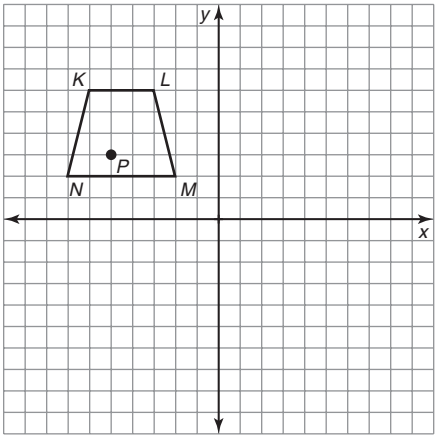
6. Rotate parallelogram *ABCD* around point *E*.



7. Rotate △*FGH* around point *J*.



8. Rotate trapezoid *KLMN* around point *P*.



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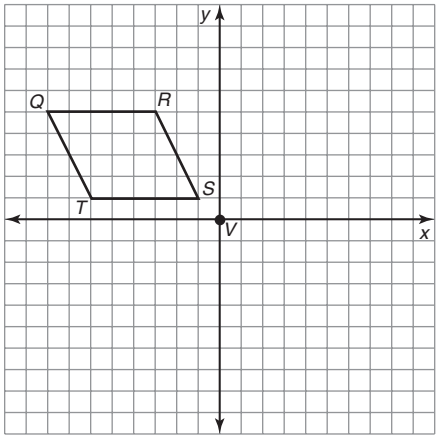
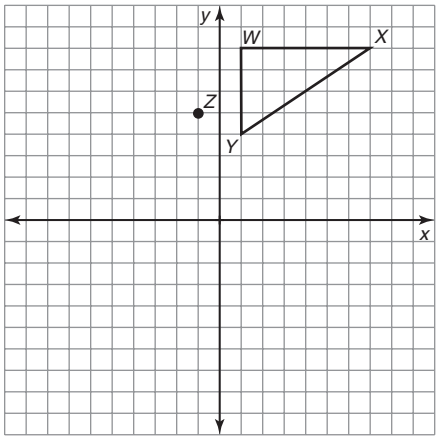
9. Rotate parallelogram *QRST* around point *V*.

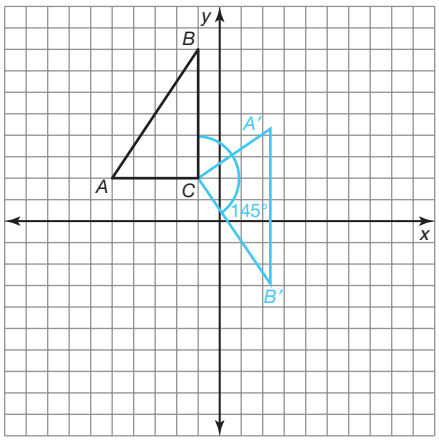


10. Rotate △*WXY* around point *Z*.

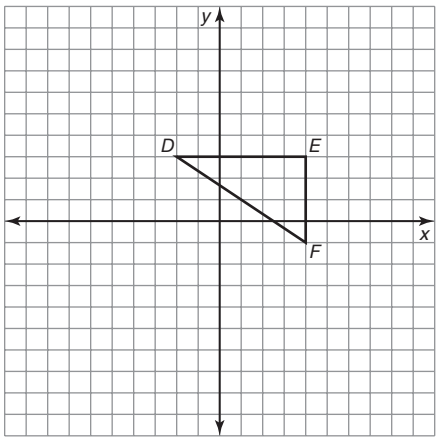


Rotate the figure in each given coordinate plane using the given angle of rotation.

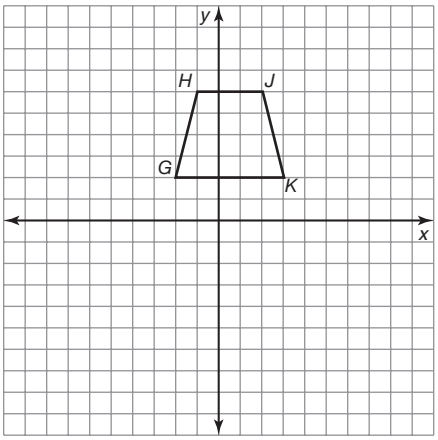
11. Rotate △*ABC* 145° clockwise around point *C*.



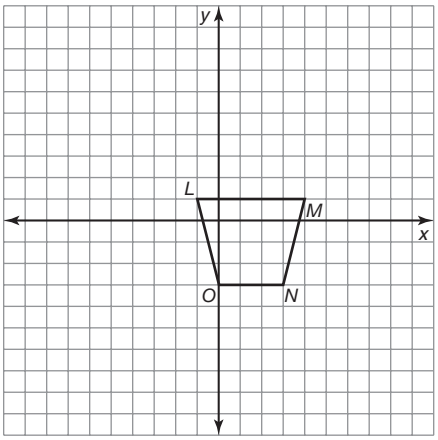
12. Rotate △*DEF* 60° clockwise around point *D*.



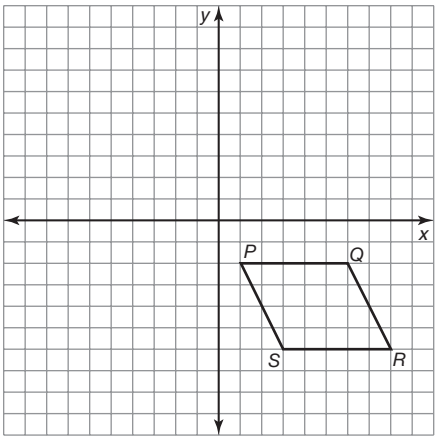
13. Rotate trapezoid *GHJK* 90° clockwise around point *G*.



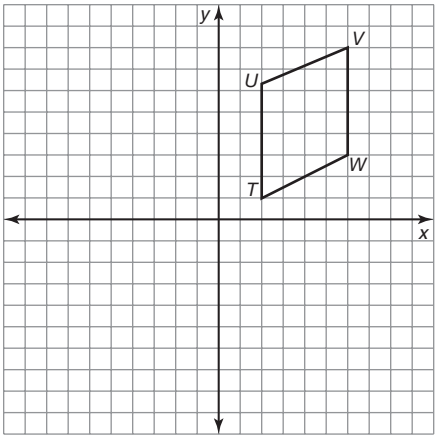
14. Rotate trapezoid *LMNO* 120° clockwise around point *M*.



15. Rotate parallelogram *PQRS* 100° clockwise around point *P*.



16. Rotate parallelogram *TUVW* 180° clockwise around point *T*.



NAME _____ DATE _____

Mirror, Mirror

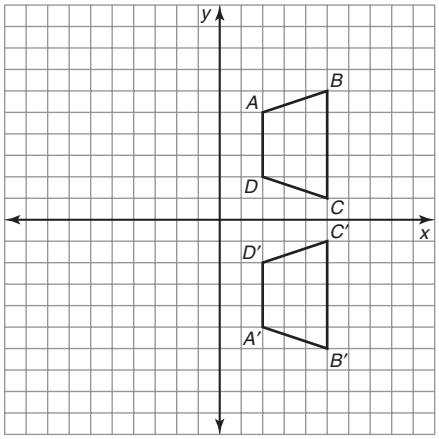
Reflections of Geometric Figures on the Coordinate Plane

Vocabulary

Identify an example of each key term in the given diagram.

1. reflection

2. reflection line



Problem Set

Determine the vertices of each reflected image.

1. A triangle with vertices $A(1, 3)$, $B(4, 8)$, and $C(5, 2)$ is reflected over the x-axis.
   The vertices of the reflected triangle are $A'(1, -3)$, $B'(4, -8)$, and $C'(5, -2)$.

2. A triangle with vertices $A(1, 3)$, $B(4, 8)$, and $C(5, 2)$ is reflected over the y-axis.

3. A triangle with vertices $D(-2, 5)$, $E(-1, 1)$, and $F(3, 6)$ is reflected over the x-axis.

4. A triangle with vertices $D(-2, 5)$, $E(-1, 1)$, and $F(3, 6)$ is reflected over the y-axis.

5. A square with vertices $G(0, 2)$, $H(-2, 4)$, $J(0, 6)$, and $K(2, 4)$ is reflected over the x-axis.

6. A square with vertices $G(0, 2)$, $H(-2, 4)$, $J(0, 6)$, and $K(2, 4)$ is reflected over the y-axis.

7. A trapezoid with vertices $L(-4, 0)$, $M(-4, -8)$, $N(-6, -5)$, and $O(-6, -3)$ is reflected over the x-axis.

8. A triangle with vertices $P(0, 0)$, $Q(-5, 0)$, and $R(0, 5)$ is reflected over the y-axis.

9. A pentagon with vertices $S(-4, 2)$, $T(0, 5)$, $U(4, 2)$, $V(2, -3)$, and $W(-2, -3)$ is reflected over the x-axis.

10. A triangle with vertices $X(2, 5)$, $Y(4, 1)$, and $Z(6, 8)$ is reflected over the x-axis and then reflected over the y-axis.

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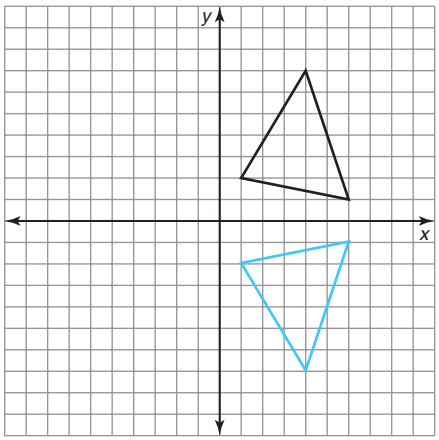
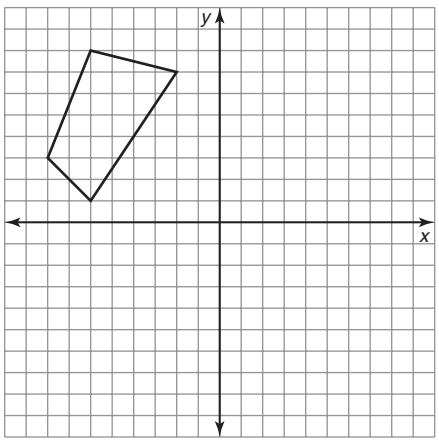
Sketch the reflection of the figure in each given coordinate plane over the specified axis or line.

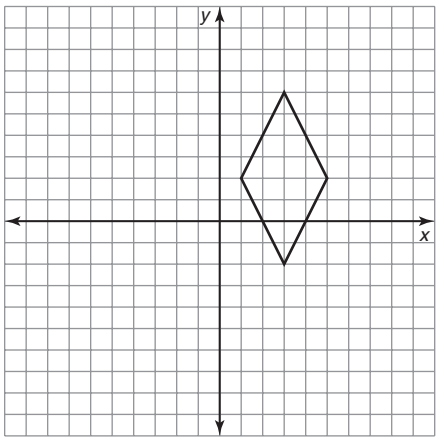
11. Reflect the triangle over the *x*-axis.



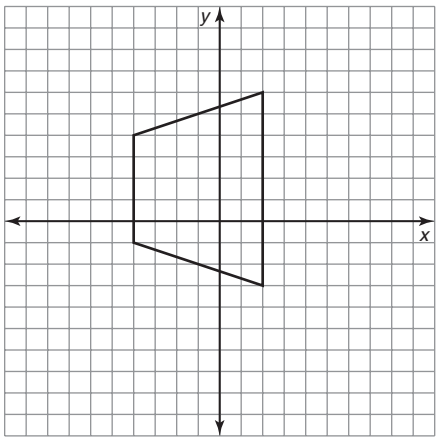
12. Reflect the quadrilateral over the *y*-axis.



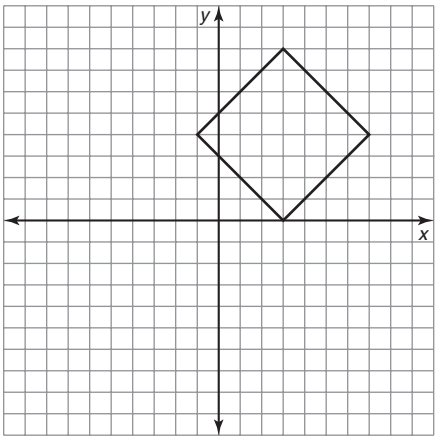
13. Reflect the rhombus over the *x*-axis.



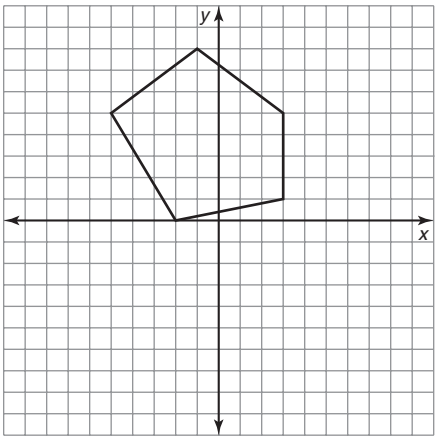
14. Reflect the trapezoid over the *y*-axis.



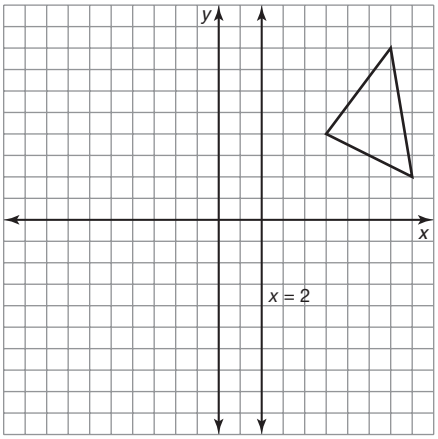
15. Reflect the square over the *x*-axis.



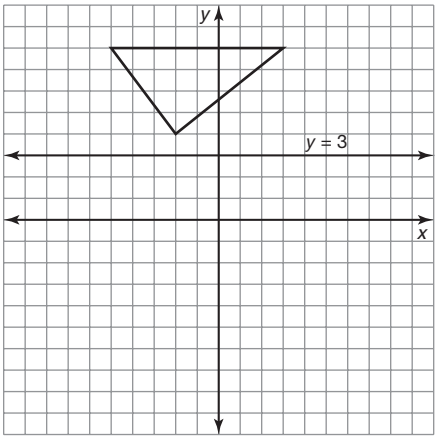
16. Reflect the pentagon over the *y*-axis.



17. Reflect the triangle over the line $x = 2$.

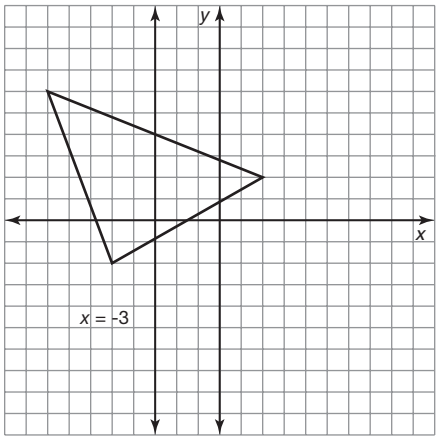


18. Reflect the triangle over the line $y = 3$.



NAME _____ DATE _____

19. Reflect the triangle over the line $x = -3$.



20. Reflect the quadrilateral over the line $y = -2$.