Lesson 7.1  Skills Practice

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

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

$$y = x + 6 \text{ or } x = y - 6$$
2. Translate the graph of \( y = x \) down 2 units. Graph the translation and write an equation to represent the translation.
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.
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.
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 $y = x$. 
9. The graph shown is the result of a translation performed on the equation $y = -x$. 

![Graph of the translated line]
10. The graph shown is the result of a translation performed on the equation \( y = -x \).
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 \( y = -x \).
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 $y = -x$. 
Lesson 7.3  Skills Practice

NAME________________________________________________________ DATE_____________________

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.
Lesson 7.3  Skills Practice

1. Rotate \( \triangle ABC \) around point \( A \).

2. Rotate trapezoid \( DEFG \) around point \( E \).

3. Rotate parallelogram \( HJKL \) around point \( L \).

4. Rotate \( \triangle MNO \) around point \( P \).

Answers may vary.
5. Rotate trapezoid $QRST$ around point $V$.

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

7. Rotate $\triangle FGH$ around point $J$.

8. Rotate trapezoid $KLMN$ around point $P$. 
9. Rotate parallelogram $QRST$ around point $V$.

10. Rotate $\triangle WXY$ around point $Z$.

11. Rotate $\triangle ABC$ $145^\circ$ clockwise around point $C$.

12. Rotate $\triangle DEF$ $60^\circ$ clockwise around point $D$. 
13. Rotate trapezoid $GHJK$ $90^\circ$ clockwise around point $G$.

14. Rotate trapezoid $LMNO$ $120^\circ$ clockwise around point $M$.

15. Rotate parallelogram $PQRS$ $100^\circ$ clockwise around point $P$.

16. Rotate parallelogram $TUVW$ $180^\circ$ clockwise around point $T$. 
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.
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 $y = 3$. 
19. Reflect the triangle over the line $x = -3$.

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