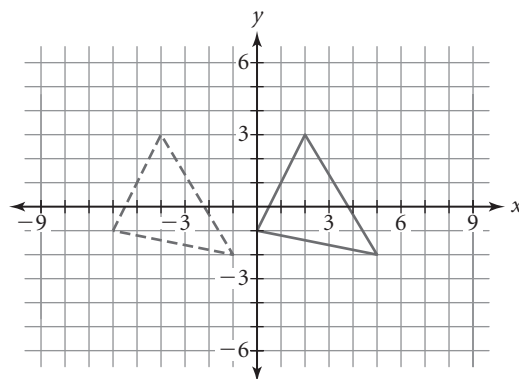


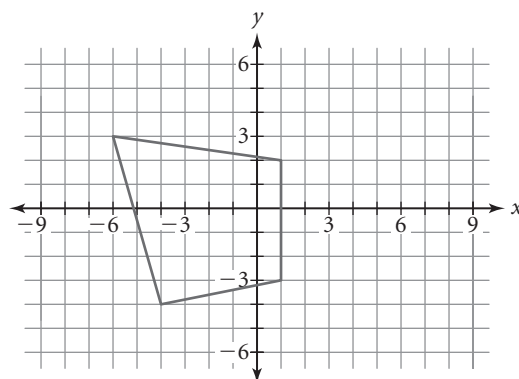
Lesson 8.1 • Translating Points

Name _____ Period _____ Date _____

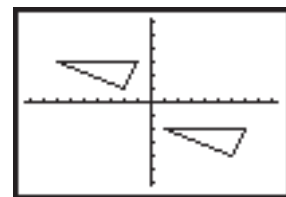
1. The dashed triangle is the image of the solid triangle after a transformation.
 - a. Name the coordinates of the vertices of the solid triangle.
 - b. Describe the transformation.
 - c. Tell how the x -coordinate of each point changes between the original figure and the image.
 - d. Tell how the y -coordinates change.



2. Consider this quadrilateral.
 - a. Name the coordinates of the vertices of the quadrilateral.
 - b. Sketch the image of the figure after a translation right 4 units and down 2 units.
 - c. Define the coordinates of the image using (x, y) as the coordinate of any point in the original figure.



3. The triangle in the lower right has its x -coordinates in list L1 and its y -coordinates in list L2.
 - a. Describe the transformation to its image in the upper left.
 - b. Write definitions for list L3 and list L4 in terms of list L1 and list L2.
 - c. How would your answer to 3b change if the triangle in the upper left was the original figure and the figure in the lower right was the image?



$[-9, 9, 1, -6, 6, 1]$

4. The coordinates of a polygon are $(-2, 1)$, $(4, 6)$, $(2, 2)$, and $(5, -1)$. A transformation of the polygon is defined by the rule $(x - 4, y - 5)$.
 - a. Describe the transformation.
 - b. Sketch the original polygon and its image on the same coordinate plane.
 - c. Use calculator lists and a graph to check your sketch for 4b.

Lesson 8.2 • Translating Graphs

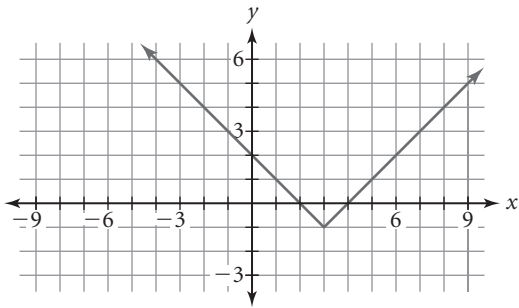
Name _____ Period _____ Date _____

1. Use $f(x) = 10 - 3|2x - 4|$ and $g(x) = (x - 4)^2 - 11$ to find

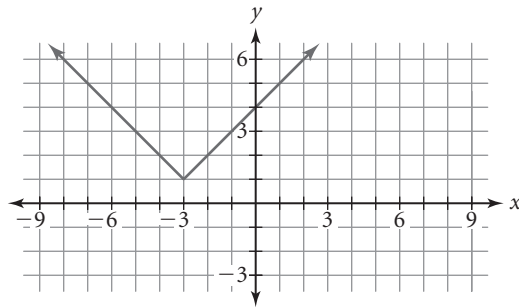
- a. $f(-3)$ b. $f(2)$ c. $f(0) - 7$ d. $f(x + 2)$
 e. $g(0)$ f. $g(-5)$ g. $g(5) + 7$ h. $g(m)$

2. Give the coordinates of the vertex for each graph.

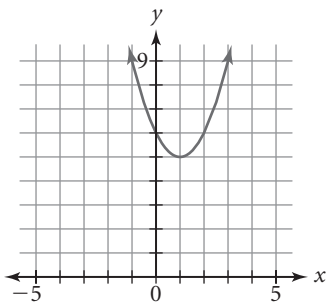
a.



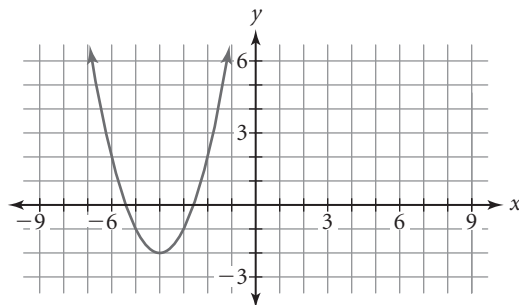
b.



c.



d.



3. Graph each equation and describe the graph as a transformation of $y = |x|$, $y = x^2$, or $y = 3^x$.

- a. $y = |x + 4|$ b. $y + 3 = (x - 2)^2$ c. $y - 1 = |x - 1|$
 d. $y - 3 = 3^{x-2}$ e. $y - 2 = x^2$ f. $y + 3 = |x - 3|$

4. Write an equation for each of these transformations.

- a. Translate the graph of $y = x^2$ right 3 units.
 b. Translate the graph of $y = |x|$ left 5 units.
 c. Translate the graph of $y = 2^x$ right 2 units.
 d. Translate the graph of $y = x^2$ up 3 units.
 e. Translate the graph of $y = |x|$ down 4 units.
 f. Translate the graph of $y = x^2$ left 2 units and up 3 units.

5. Describe each graph in Exercise 2 as a transformation of $y = |x|$ or $y = x^2$. Then write its equation.

Lesson 8.3 • Reflecting Points and Graphs

Name _____ Period _____ Date _____

1. Use $f(x) = 2(x + 1)^2 - 4$ and $g(x) = -|x - 4| + 1$ to find

a. $f(-3)$

b. $-3 \cdot f(2)$

c. $f(-x)$

d. $-f(x)$

e. $g(-3)$

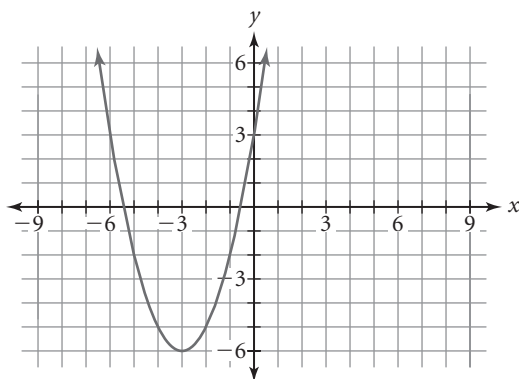
f. $-3 \cdot g(2)$

g. $g(-x)$

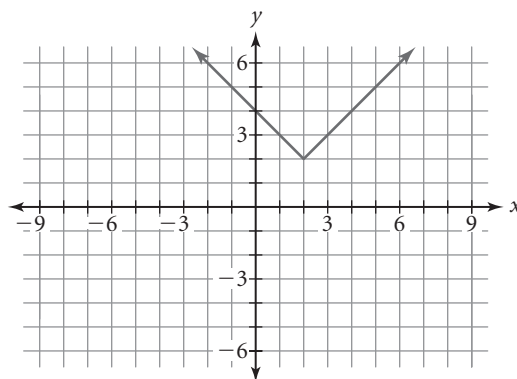
h. $-g(x)$

2. Describe each graph as a transformation of $y = |x|$ or $y = x^2$. Then write its equation.

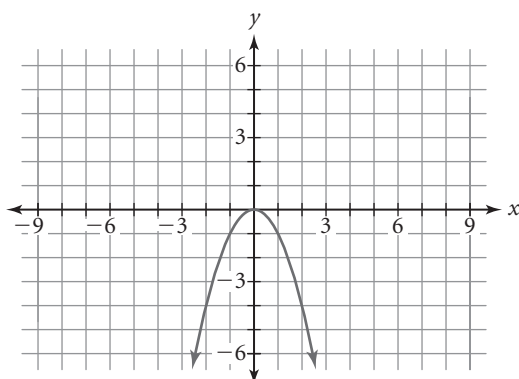
a.



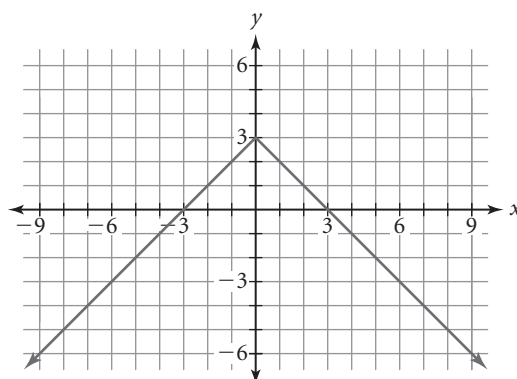
b.



c.



d.



3. Enter the function $f(x) = 5 - 2x$ into Y1 on your calculator.

a. Predict what the graph of $y = f(-x)$ will look like. Check your answer by entering $y = f(-x)$ into Y2 and graphing both Y1 and Y2.

b. Predict what the graph of $y = -f(x)$ will look like. Check your answer by entering $y = -f(x)$ into Y2 and graphing both Y1 and Y2.

4. Describe each equation as a transformation of the parent function $y = |x|$. Check your answers by graphing on your calculator.

a. $y = -|x| - 4$

b. $y = |-x| - 4$

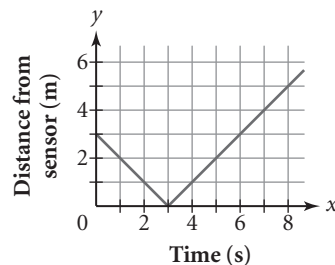
c. $y = -|x - 4|$

d. $y = |-x - 4|$

Lesson 8.4 • Stretching and Shrinking Graphs

Name _____ Period _____ Date _____

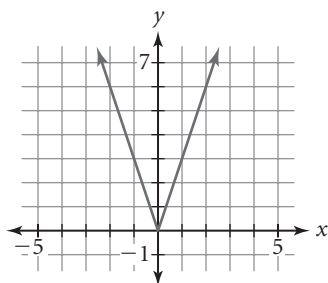
1. Greta and Tom are using a motion sensor for a “walker” investigation. They find that this graph models the data for Greta’s walk.



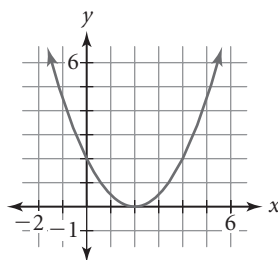
- a. Write an equation for this graph.
 - b. Describe Greta’s walk.
2. Tom walks so that his distance from the sensor is always half Greta’s distance from the sensor.
- a. Sketch a graph that models Tom’s walk.
 - b. Write an equation for the graph in 2a.

3. Write an equation for each graph.

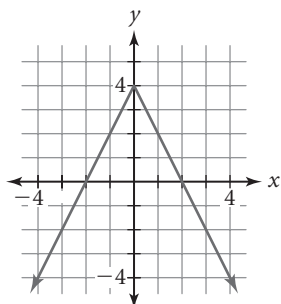
a.



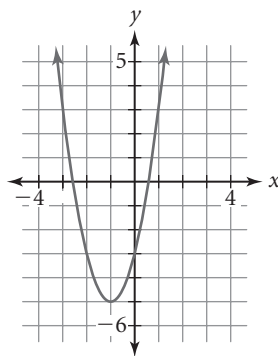
b.



c.



d.



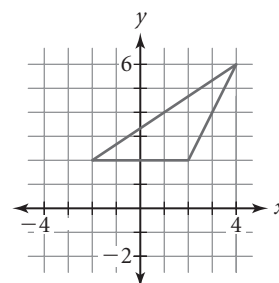
4. Graph each function on your calculator. Then describe how each graph relates to its parent function.

a. $y = 0.25|x - 4| - 3$

b. $y = -0.5(x + 3)^2 + 2$

c. $y = 3(x + 5) - 4$

5. Draw this triangle on graph paper or on your calculator. Then draw the image defined by each of the definitions in 5a–c. Describe how each image relates to the original figure.



a. $(2x, 2y)$

b. $(x, 2y)$

c. $(0.5x, 0.5y)$

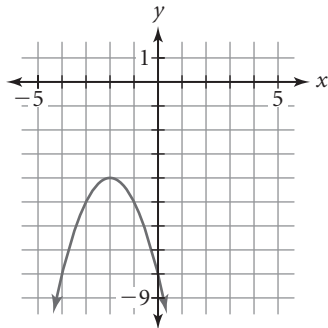
d. $(3x, y)$

Lesson 8.6 • Introduction to Rational Functions

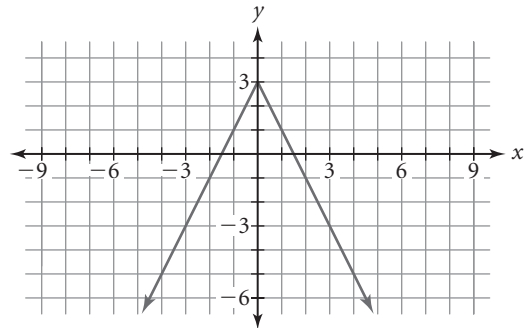
Name _____ Period _____ Date _____

1. Describe each graph as a transformation of the parent function $y = |x|$ or $y = x^2$. Then write its equation.

a.



b.



2. Write an equation that generates this table of values.

x	-4	-3	-2	-1	0	1	2	3	4
y	$-\frac{1}{3}$	$-\frac{1}{2}$	-1	undefined	1	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$

3. Describe each function as a transformation of the graph of the parent function $y = \frac{1}{x}$. Then sketch the graph of each function and list values that are not part of the domain.

a. $y = -\frac{1}{x}$

b. $y = \frac{1}{-x}$

c. $y = \frac{3}{x}$

d. $y = \frac{1}{2x}$

e. $y = \frac{1}{x-4}$

f. $y = \frac{1}{x} - 2$

g. $y = \frac{2}{x-3}$

h. $y = \frac{1}{x+2} + 3$

4. Reduce each rational expression to lowest terms. State any restrictions on the variable.

a. $\frac{21x}{35}$

b. $\frac{15x^2}{10x}$

c. $\frac{6(x+3)}{(x+3)(x-1)}$

d. $\frac{8+4x}{2x}$

5. Perform each indicated operation and reduce the result to lowest terms. State any restrictions on the variable.

a. $\frac{2x}{3} + \frac{5x}{6}$

b. $\frac{2x}{3} - \frac{x}{4}$

c. $\frac{4x}{5} \cdot \frac{10}{3x^2}$

d. $\frac{3}{4x} \div \frac{1}{12x^3}$

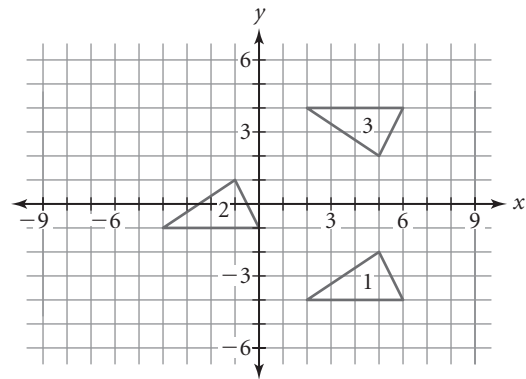
Lesson 8.7 • Transformations with Matrices

Name _____ Period _____ Date _____

1. The matrix $\begin{bmatrix} -1 & 4 & 1 & -4 \\ 1 & 1 & -2 & -2 \end{bmatrix}$ represents a quadrilateral.
- Name the coordinates and draw the quadrilateral.
 - What matrix would you add to translate the quadrilateral right 4 units?
 - Calculate the matrix representing the image if you translate the quadrilateral right 4 units.

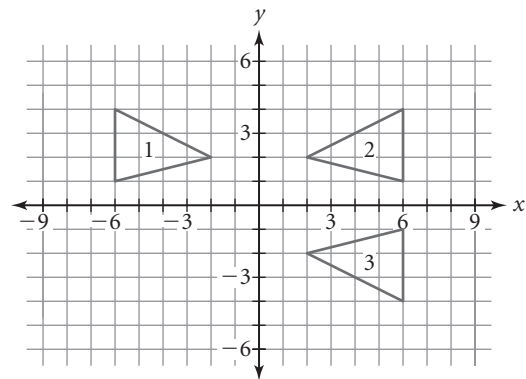
2. Refer to these triangles.

- Write a matrix to represent triangle 1.
- Write the matrix equation to transform triangle 1 into triangle 2.
- Write the matrix equation to transform triangle 1 into triangle 3.



3. Refer to these triangles.

- Write a matrix to represent triangle 1.
- Write the matrix equation to transform triangle 1 into triangle 2.
- Write the matrix equation to transform triangle 1 into triangle 3.



4. Add or multiply each pair of matrices.

a. $\begin{bmatrix} 2 & 5 \\ -3 & 1 \end{bmatrix} + \begin{bmatrix} -5 & -5 \\ 2 & 2 \end{bmatrix}$

b. $[-3 \quad 1.5] \cdot \begin{bmatrix} 5 & -2 \\ -6 & 2 \end{bmatrix}$

c. $\begin{bmatrix} 3 \\ 7 \end{bmatrix} + \begin{bmatrix} -7 \\ -3 \end{bmatrix}$

d. $[1 \quad -2.5] \cdot \begin{bmatrix} 5 & 0 & -1 \\ 2 & -5 & -4 \end{bmatrix}$