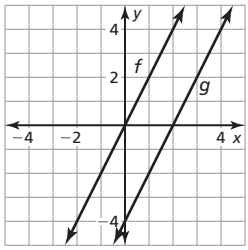
Student Journal Answers

Chapter 1

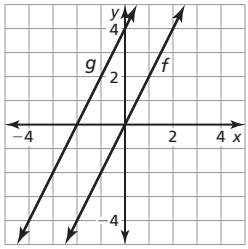
Chapter 1 Maintaining Mathematical Proficiency

1.



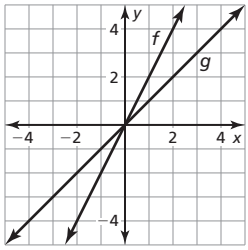
The graph of g is a vertical translation 4 units down from the graph of f.

2.



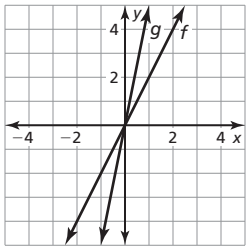
The graph of g is a horizontal translation 2 units left of the graph of f.

3.



The graph of g is a horizontal stretch of the graph of f by a factor of 2.

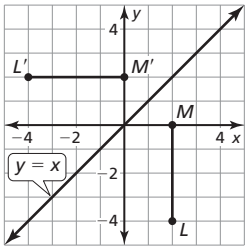
4.



The graph of g is a vertical stretch by a factor of 3 of the graph of f.

5. The graph of h is a vertical shrink by a factor of $\frac{1}{3}$, followed by a reflection in the y-axis, and a vertical translation 2 units up of the graph of f.

6.



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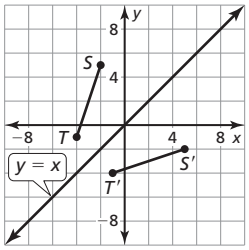

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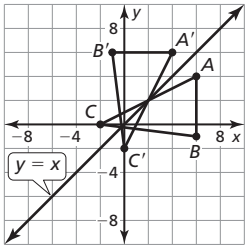
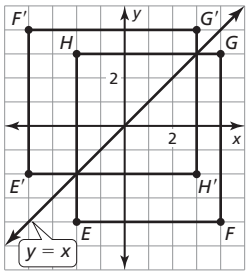


9.



10. Quadrant III

1.1 Explorations

1. **a.** D
b. C
c. E
d. F
e. A
f. B

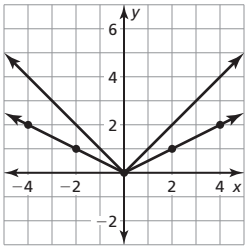
2. a stretches or shrinks the graph and determines whether the graph opens up or down; h translates the graph horizontally; k translates the graph vertically.

3. $g(x) = -|x + 1| + 1$

1.1 Extra Practice

1.

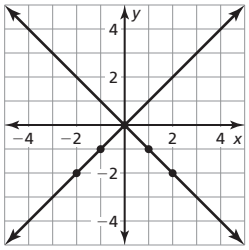
x	−4	−2	0	2	4
$t(x)$	2	1	0	1	2



The graph of t is a vertical shrink of the graph of f by a factor of $\frac{1}{2}$. The domain is all real numbers. The range is $y \geq 0$.

2.

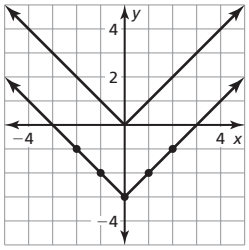
x	-2	-1	0	1	2
$u(x)$	-2	-1	0	-1	-2



The graph of u is a reflection in the x-axis of the graph of f. The domain is all real numbers. The range is $y \le 0$.

3.

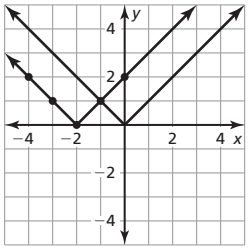
x	-2	-1	0	1	2
$p(x)$	-1	-2	-3	-2	-1



The graph of p is a vertical translation 3 units down of the graph of f. The domain is all real numbers. The range is $y \ge -3$.

4.

x	-4	-3	-2	-1	0
$r(x)$	2	1	0	1	2



The graph of p is a horizontal translation 2 units left of the graph of f. The domain is all real numbers. The range is $y \ge 0$.

1.2 Explorations

1. a. yes; No vertical line can be drawn through more than one point on the graph.

b. 0; The point (0, 0) is plotted.

c. $-x$

d. 2

e. $-x$; 2

2. a. yes; No vertical line can be drawn through more than one point on the graph.

b. -2; 0; 2; 4

3. Write the expression for each part of the function along with the part of the domain to which the expression applies.

4. $f(x) = \begin{cases} -x, & \text{if } x \le 0 \\ x, & \text{if } x > 0 \end{cases}$ or $f(x) = \begin{cases} -x, & \text{if } x < 0 \\ x, & \text{if } x \ge 0 \end{cases}$

1.2 Extra Practice

1. -1

2. 2

3. -9

4. -13

5. 2

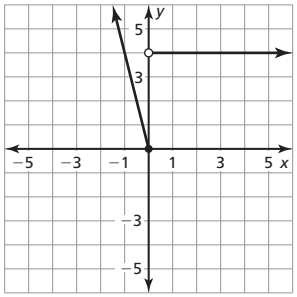
6. -10

7. -3

8. -9

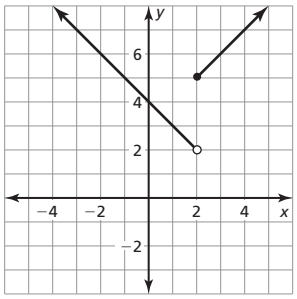
9. -16

10.



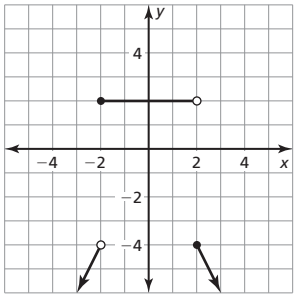
domain: all real numbers;
range: $y \ge 0$

11.



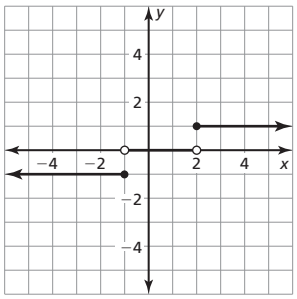
domain: all real numbers
range: $y > 2$

12.



domain: all real numbers
range: $y \le -4$ or $y = 2$

13.



domain: all real numbers;
range: $\{-1, 0, 1\}$