Answers

2. a. quadratic function

b. after $5\sqrt{2} \approx 7.07$ years

c. domain: $x \geq 0$, range: $0 \leq y \leq 15{,}000$

3. *Sample answer:* domain: all real numbers; range: all real numbers; vertical shrink by a factor of $\frac{1}{2}$; reflection in y-axis; translation 5 units up

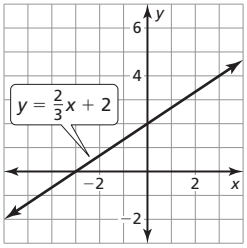
4. *Sample answer:* domain: all real numbers; range: $y \leq -3$; vertical shrink by a factor of 4; reflection in x-axis; translation 3 units down

5. *Sample answer:* domain: all real numbers; range: $y \geq 5$; horizontal stretch by a factor of 3; reflection in y-axis; translation 5 units up and 3 units left

1.1 Puzzle Time

BECAUSE PEOPLE ALWAYS SAY IF IT IS NOT BROKEN DO NOT FIX IT

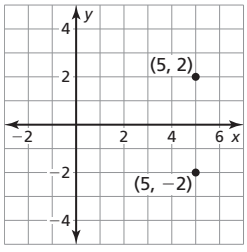
1.2 Start Thinking



The equation becomes $y = \frac{2}{3}x + 3$; The equation becomes $y = \frac{2}{3}x + 1$; When 1 is added, by definition, the y-intercept moves up one unit. The slope is the same, so each point is moved up one unit. When -1 is added, the y-intercept moves down one unit, along with every other point on the line.

1.2 Warm Up

1.



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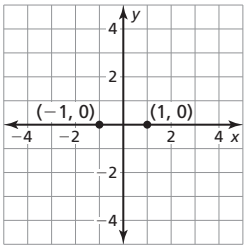

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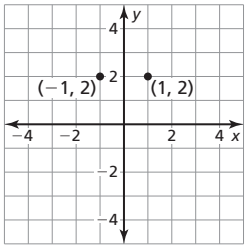

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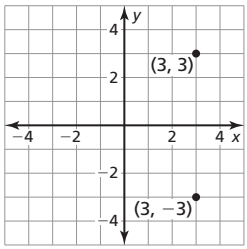

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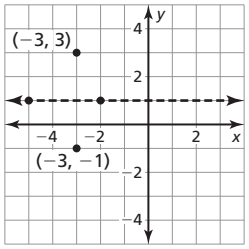
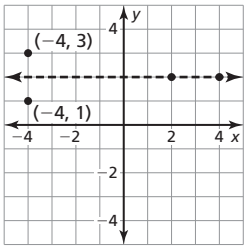


6.



1.2 Cumulative Review Warm Up

1. one

2. one

3. zero

4. one

5. two

6. zero

1.2 Practice A

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

2. $g(x) = x - 3$

3. $g(x) = |3x + 2| + 1$

4. $g(x) = 4x - 2$

5. $g(x) = 3x - 7$

6. $g(x) = -\frac{1}{3}x + 2$

7. $g(x) = |-4x| - 6$

8. $g(x) = |-3x - 5| + 3$

9. $g(x) = 4x + 12$

10. $g(x) = \frac{4}{3}x + 1$

11. $g(x) = |9x| + 2$

12. $g(x) = \left|\frac{1}{3}x + 1\right|$

13. $g(x) = \frac{1}{3}x - 4$

14. $g(x) = |2x + 3|$

1.2 Practice B

1. $g(x) = 5x - 27$

2. $g(x) = 3x + 10$

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

4. $g(x) = |2x| + 1$

5. $g(x) = x + 3$

6. $g(x) = -\frac{2}{3}x + 4$

Answers

7. $g(x) = -5 + |-x + 8|$ **8.** $g(x) = |-4x - 1| + 2$

9. $g(x) = 3 - \frac{1}{2}x$ **10.** $g(x) = x + \frac{5}{3}$

11. $g(x) = |9x| + 2$ **12.** $g(x) = -4|x - 2| + 8$

13. $g(x) = \frac{1}{4}x + \frac{5}{4}$ **14.** $g(x) = -|x + 2|$

1.2 Enrichment and Extension

1. $g(x) = 2x - 8; x = 4$

2. $g(x) = -2x - 1; x = -\frac{1}{2}$

3. $g(x) = 6x - 6; x = 1$

4. $g(x) = 6x + 4; x = -\frac{2}{3}$

5. $g(x) = 4x - 14; x = \frac{7}{2}$

6. $g(x) = -2x - 6; x = -3$

7. $g(x) = |x - 1| - 2; x = 3, x = -1$

8. $g(x) = |x + 3| + 1;$ no solution, does not intersect x-axis

9. $g(x) = -|x + 5|; x = -5$

10. $g(x) = 2|x + 1| - 6; x = 2, x = -4$

11. $g(x) = -|4x - 38|; x = \frac{19}{2}$

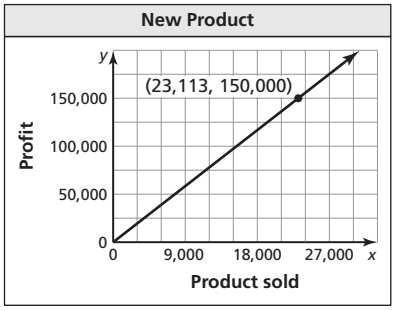
12. $g(x) = -\frac{1}{2}|x - 3| + 2; x = 7, -1$

1.2 Puzzle time

JAMES MONROE

1.3 Start Thinking

You can model this situation with the equation $y = 14.99x - 8.50x,$ where x represents the number of units sold and y represents the total profit. You are looking for the point that has a y-value of 150,000. By substituting 150,000 for y in the equation and solving for x, you obtain $x = 23{,}113$.



1.3 Warm Up

1. $D = \{0 \le x \le 82\}$
$R = \{0 \le y \le 12{,}300{,}000\}$

2. $D = \{0 \le x \le 5\}$
$R = \{0 \le y \le 4220\}$

3. $D = \{0 \le x \le 2500\}$
$R = \{0 \le y \le 13{,}125\}$

1.3 Cumulative Review Warm Up

1. 5.1 **2.** 9.3

3. 10.3 **4.** $130,533.30

1.3 Practice A

1. $y = \frac{3}{50}x;$ The sales tax rate is $\frac{3}{50} = 6\%$.

2. $y = -\frac{1}{2}x + 10;$ An amount of $\frac{1}{2}$ ounce of soap is used each day.

3. Soapy Car Wash; 6 extras

4. not linear

5. yes; $y = \frac{1}{2}x; y = 7.5;$ This means 7.5 cars are washed in 15 minutes.

6. yes; A correlation coefficient close to -1 is a strong, negative correlation.