Lesson 2.2.2

2-102. See below:

a. $y = (x - 4)^2$

b. Yes; justifications vary

c. Answers vary. Students could look at the value that will make the quantity in the parentheses equal to zero.

2-103. Possibilities include: lines, parabolas, hyperbolas, cubics, square root functions, exponentials, and absolute value functions

2-105. $y = x$; $y = a(x - h) + k$

a. $y = \frac{4}{5}(x - 3) + 9$

b. $y = m(x + 1) + 5$; $-2 = m(8 + 1) + 5$, $m = -\frac{7}{9}$

Review & Preview

2-107. See below:

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

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

c. $y = -2(x + 6)^2$

2-108. See below:

a. domain: all real numbers, range: $y \geq 3$

b. domain: all real numbers, range: all real numbers

c. domain: all real numbers, range: $y \leq 0$

2-109. See below:

a. compresses or stretches

b. shifts up or down

c. shifts left or right

d. shifts up or down

2-110. See below:

a. $y = 0.4 \cdot 0.5^x$

b. $y = 8 \cdot 2^x$

2-111. See below:

a. $\frac{2}{25}$

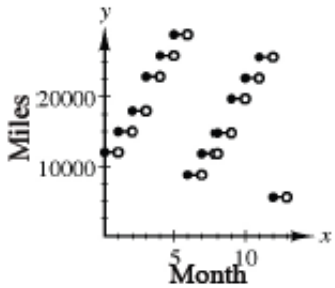
b. $\frac{3x^2y^3}{z^4}$

c. $54m^5n$

d. $y\sqrt[3]{5x^2z}$

2-112. See below:

a. See table and graph below.



Month	Miles
1	15,000
2	18,000
3	22,900
4	25,900
5	28,900
6	8,800
7	11,800
8	14,800
9	19,700
10	22,700
11	25,700
12	5,600

b. He had 28,900 miles in May.

c. 5600 miles

d. No, he will not be able to go in December, he will only have 24,200 miles.

2-113. See below:

a. $x = \pm\sqrt{\frac{y}{2}} + 17$

b. $x = (y + 7)^3 - 5$

2-114. See below:

a. (10, 48)

b. $\left(\frac{29}{5}, \frac{9}{5}\right)$

2-115. See below:

a. $8\sqrt{3}$

b. $3\sqrt{x}$

c. 12

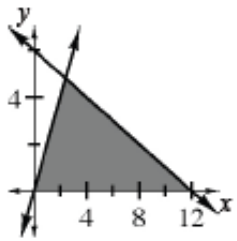
d. 108

2-116. See below:

a. $g(\frac{1}{2}) = -4.75$

b. $g(h + 1) = h^2 + 2h - 4$

2-117. See graph below**.**



a. $y = 2x$: (0, 0), $y = -\frac{1}{2}x + 6$: (0, 6), (12, 0)

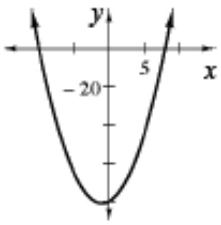
b. It should be a triangle with vertices (0, 0), (12, 0), and (2.4, 4.8).

c. domain: $0 \le x \le 12$, range: $0 \le y \le 4.8$

d. $A = \frac{1}{2}(12)(4.8) = 28.8$ square units

2-118. $y \approx 2(x-5)^2 + 2$ and $y \approx -\frac{1}{2}(x-5)^2 + 2$

2-119. See graph below; $y = (x+1)^2 - 81$; x-intercepts: $(-10, 0)$, $(8, 0)$, y-intercept: $(0, -80)$; vertex: $(-1, -81)$.



2-120. Yes, when $n = 117$.