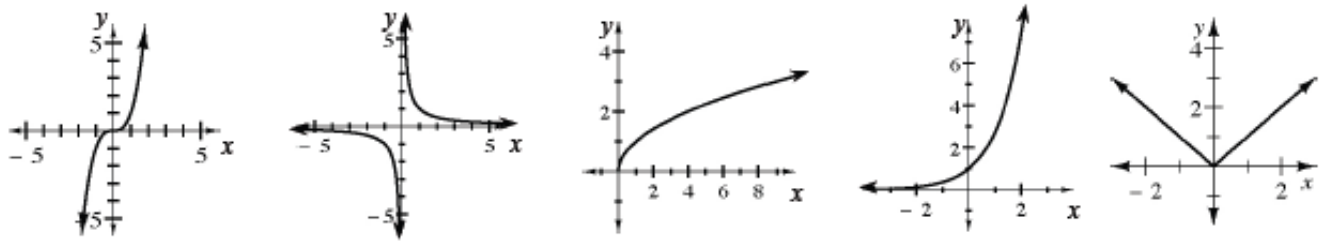
Lesson 2.2.1

2-77. See below:

a. See graphs below.

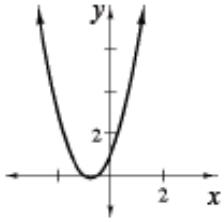


2-79. See below:

a. a is the stretch/compression factor, h is the x-coordinate of the vertex, and k is the y-coordinate of the vertex.

2-81. possible equation: $y = -\frac{4}{25}(x-5)^2 + 8$, standing at (0, 0), domain: $0 \le x \le 10$, range: $4 \le y \le 8$

2-82. See graph below:



a. x: $(\frac{1}{2}, 0)$, $(-1, 0)$; y: $(0, 1)$

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

c. $(-\frac{3}{4}, -\frac{1}{8})$ or $(-0.75, -0.125)$

2-83. Move it up 0.125 units: $y = 2x^2 + 3x + 1.125$

2-84. See below:

a. $2\sqrt{6}$

b. $3\sqrt{2}$

c. $2\sqrt{3}$

d. $5\sqrt{3}$

2-85. See below:

a. Years; 0.89; 12250; $12250(0.89)^x$

b. Months; 1.005; 1000; $1000(1.005)^x$

2-86. See below:

a. 32

b. $x^2y^2\sqrt{x}$

c. $\frac{x^2}{y}$

2-87. $c + m = 18$ and $\$4.89c + \$5.43m = \$92.07$; 10.5 lbs. of Colombian and 7.5 lbs. of Mocha Java.

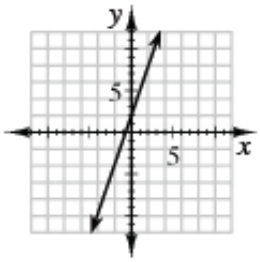
2-88. See below:

a. 15 ft

b. Surface area of concrete: 793.14 sq. ft.; 528.76 cu. ft.; $1,263.74

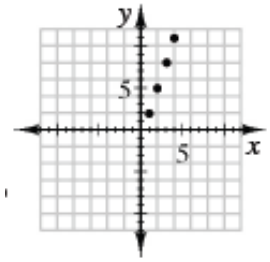
2-89. See below:

a. See graph below.



b. $y = 3x + 2$

c. 2, 5, 8, 11



d. One is continuous and one is discrete. They have the same slope so the "lines" are parallel, but they have different intercepts.

2-90. See below:

a. $4.116 \cdot 10^{12}$

b. $y = 1.665(10^{12})(1.0317)^t$

c. Explainations vary.

2-91. See below:

a. $6\sqrt{x} + 3\sqrt{y}$

b. 32

c. 5

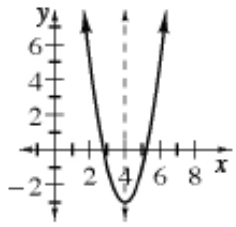
d. $\frac{\sqrt{3}}{2}$

2-92. See below:

a. $6x^3 + 8x^4y$

b. $x^{14}y^9$

2-93. See graph below. line of symmetry $x = 4$



2-94. See below:

a. $4\pi + \frac{4}{3}\pi \approx 16.755\,\text{m}^3$

b. No, it will not double, because of the r, r^2, r^3 relationship. $V = \frac{80\pi}{3} \approx 83.776\ \text{m}^3$

c. $V = \frac{4}{3}\pi r^3 + 4\pi r^2$

2-95. See below:

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

b. $y = x^2 - 5$

c. $y = (x - 3)^3$

d. $y = 2^x - 3$

e. $y = 3x - 6$

f. $y = (x + 2)^3 + 3$

g. $y = (x + 3)^2 - 6$

h. $y = -(x - 3)^2 + 6$

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

2-96. He should move it up 6 units or redraw the axes 6 units lower.

2-97. See below:

a. 18

b. $\frac{3}{2}$

c. $\frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$

d. $11 + 6\sqrt{2}$

2-98. See below:

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

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

c. $(x^2 + 9y^2)(x - 3y)(x + 3y)$

d. $2x^3(4 + x^4)$

e. They all contain a factor that is a difference of squares.

2-99. $x = \frac{-by^3+c+7}{a}$

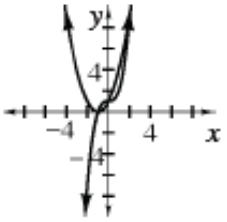
2-100. See below:

a. $t(n) = -6n + 26$

b. $t(n) = -1.5(4)^n$ or $-6(4)^{n-1}$

2-101. See below:

a. See graph below.



b. 2

c. −1

d. $\sqrt[3]{-13}$

e. no solution

f. Three because the graphs cross three times

g. $x^3 - x^2 - 2x$