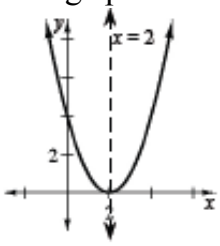
Lesson 2.1.2

2-11. See below:

a. See graph below. Line of symmetry is $x = 2$.



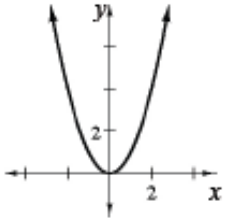
b. Examples are $y = 2(x – 2)(x – 2)$ and $y = \frac{1}{2}(x – 2)(x – 2)$.

c. Examples are $y = –(x – 2)(x – 2)$ and $y = –2(x – 2)(x – 2)$. Line of symmetry is still $x = 2$.

d. One example is $y = –(x + 4)(x + 4)$. Line of symmetry is $x = –4$.

e. Answers vary.

2-13. See graph below.



a. $y = 2x^2$ is the most common answer.

b. $y = 0.5x^2$ is one answer.

c. $y = –x^2$

d. $y = x^2 – 5$

e. $y = (x – 3)^2$

f. e.g. $y = 4(x + 3)^2$

2-14. One example is $y = –0.5(x + 2)^2 + 6$, $(–2, 6)$.

2-15. See below:

b. $y = a(x - h)^2 + k$

2-16. Explanations vary, but a careful graph is to scale, done on graph paper, and with key points clearly labeled.

2-17. See below:

a. (0, –6)

b. (–6, 0) and (1, 0)

c. x-intercepts at (0, 0) and (–5, 0) and y-intercept at (0, 0); the graph of $p(x)$ is 6 units lower than $q(x)$

d. –6

2-18. See below:

a. $z = 1.5$

b. $z = -\frac{18}{5}$

c. $z = 8$

d. $z = -3, 2$

2-19. See below:

a. 3

b. $\frac{1}{x^2y^4}$

c. $\frac{\sqrt{y}}{x}$

2-20. See below:

a. $3p + 3d = 22.50$ and $p + 3d + 3(8) = 37.5$, so popcorn costs \$4.50 and a soft drink costs \$3.00.

b. Answers vary.

2-21. See below:

a. $\sqrt{146} \approx 12.1$

b. $\sqrt{145} \approx 12.0$

c. $\sqrt{50} \approx 7.1$

d. $5\sqrt{2}$

2-22. Maximum profit is \$25 million when $n = 5$ million.

2-23. See below:

a. vertex at (–3, –8), opens up, vertically stretched.

b. x-intercepts (–5, 0) and (–1, 0); y-intercept (0, 10)

2-24. See below:

a. Tables or graphs should be the same.

b. See sample student work below.
$y = 3(x - 1)^2 - 5$
$y = 3(x^2 - 2x + 1)^2 - 5$
$y = 3x^2 - 6x + 3 - 5$
$y = 3x^2 - 6x - 2$

c. Students could point out that the a ends up being the coefficient of x^2 after the binomial is squared.

2-25. See below:

a. $y = (x - 8)^2 - 5$

b. $y = 10(x + 6)^2$

c. $y = –0.6(x + 7)^2 - 2$

2-26. Some possibilities are (0, –9) and (6, –5).

2-27. See below:

a. $5\sqrt{2}$

b. $6\sqrt{2}$

c. $3\sqrt{5}$

2-28. See below:

a. $x = 46.71$

b. $x = 8.19$

2-29. See below:

a. About $365.00

b. $y = 300(1.04)^x$