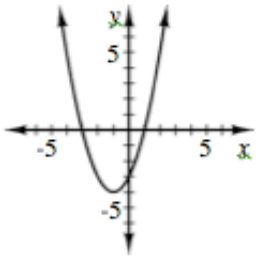
Lesson 6.1.5

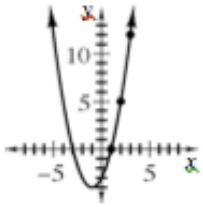
6-60. See the "Suggested Lesson Activity" for expected responses.

6-61. See graph below. Substitute x- and y-values into $y = ax^2 + bx + c$, and solve the systems of equations for a, b, and c. Results: $a = 1$, $b = 2$, $c = –3$; $y = x^2 + 2x – 3$.



6-62. It takes 2 points to determine the equation of a linear function and 3 to determine the equation of a quadratic (because they are not collinear).

a. See graph below.



b. $x = 3$, $y = 12$

c. $0 = a(1)^2 + b(1) + c$, $5 = a(2)^2 + b(2) + c$, $12 = a(3)^2 + b(3) + c$

d. $a = 1$, $b = 2$, $c = –3$

e. $y = x^2 + 2x – 3$, which can be checked by substituting the points one at a time into the equation.

6-64. See below:

a. $y = 2x^2 – 3x + 1$

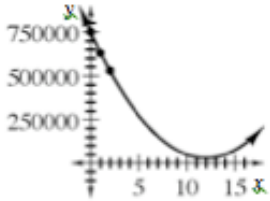
b. $y = –0.5x + 3$

6-65. $a = 0$, so there is no x^2-term. The points are collinear.

6-66. See below:

a. (0, 750), (1, 635), (2, 530)

b. Graph shown below, a parabola.



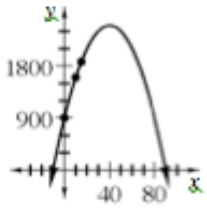
c. $y = (5x^2 - 120x + 750)(1000)$

d. At 10 minutes, the shuttle burns.

6-67. See below:

a. (0, 900), (10, 1600), (15, 1875)

b. See graph below.



c. $y = -x^2 + 80x + 900$

d. After 90 days

e. 10 days.

6-68. See below:

a. (10, 40), (30, 60), (40, 50)

b. $y = -\frac{1}{15}x^2 + \frac{11}{3}x + 10$

c. She will be 1 minute and 40 seconds late.

6-70. Sample answer: You would have to use four points to write four equations and then solve for a, b, c, and d.

6-71. $x = -1, y = 3, z = 5$

6-72. $y = 3x^2 - 5x + 7$

6-73. See below:

a. $\frac{x+3}{x-4}$

b. $\frac{1}{x(x+2)}$

6-74. See below:

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

b. $2b + 4a^2$

c. $6x - 1$

d. xy

6-75. See below:

a. $x = 12^y$

b. $y^x = 17$

c. $2x = \log_{1.75} y$

d. $7 = \log_x 3y$

6-76. $x = 14$

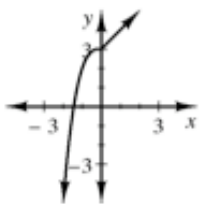
6-77. See below:

a. ≈ 0.0488 grams

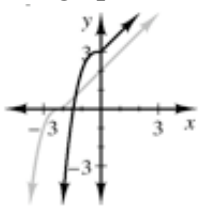
b. Roughly between 4600 and 6700 depending on how the base is rounded.

c. Never.

6-78. See graph below.



a. See graph below.



b. $x > 0$, $y = x + 2$ and $x \leq 0$, $y = (x + 2)^3$

6-79. See below:

a. 2^4

b. 2^{-3}

c. $2^{1/2}$

d. $2^{2/3}$

6-80. $x = -1$, $y = 3$, $z = 6$

6-81. $y = 2x^2 - 3x + 5$

6-82. See below:

a. $24 = b^a$

b. $7 = (2y)^{3x}$

c. $5x = \log_2 3y$

d. $6 = \log_{2q} 4p$

6-83. See below:

a. $\frac{3}{x+1}$

b. $\frac{x-4}{x^2-3x+2}$

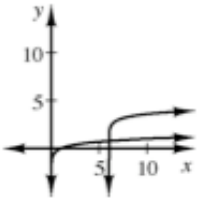
6-84. Yes, Hannah is correct; $4(x - 3)^2 - 29 = 4x^2 - 24x + 7$ and $4(x - 3)^2 - 2 = 4x^2 - 24 + 34$.

6-85. See below:

a. $y = 2(x - 2)^2 - 1$, vertex $(2, -1)$, axis of symmetry $x = 2$

b. $y = 5(x - 1)^2 - 12$, vertex $(1, -12)$, axis of symmetry $x = 1$

6-86. See graph below. $y = \log(x - 6) + 3$



6-87. See below:

a. $2a^2 - 4$

b. $18a^2 - 4$

c. $2a^2 + 4ab + 2b^2 - 4$

d. $2x^2 + 28x + 94$

e. $50x^2 + 60x + 14$

f. $10x^2 - 17$