Lesson 8.1.3

8-45. See below:

a. $y = x(x + 3)(x - 2)$, may use $x = -2$ or $x = 1$ to check

b. $y = -x^3(x + 3)(x - 2)$, may use $x = -2$, $x = -1$ or $x = 1$ to check

c. Students are likely to try $y = (x + 2)^2(x - 1)$ or $y = -(x + 2)^2(x - 1)$ and find that it does not check. The equation needs a stretch factor.

8-46. The second graph is a vertical stretch of the first.

8-47. See below:

a. Test a point, $y = 2(x + 3)(x + 1)(x - 2)^2$

b. You could substitute the coordinates into the equation for x and y and solve for a. $a = 2$. You could plug in other points to see how well they fit.

8-48. See below:

a. min: 4th-degree

b. 0, 2, and 3. 2 is a double root

c. $y = 0.64x(x - 2)^2(x - 3)$

d. ≈ 181 feet

8-49. See below:

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

b. $y = -\frac{3}{4}(x + 2)^2(x - 1)^2$

8-50. A likely answer is $y = 3(x + 1)^2(x - 4)$, but other answers are possible.

8-51. Yes; the bounce is accounted for and substitution verifies that the given points work in the equation. Answers vary.

8-52. No, because the new point only satisfies the equation $y = 3(x + 1)^2(x - 4)$.

8-53. Sample answer: You have to know how many times a factor is used, or you need an additional point to check.

8-54. Stretch factor is −2; $f(x) = -2(x + 2)^2(x - 1)$.

8-55. See below:

a. degree 4, $a_4 = 6$, $a_3 = -3$, $a_2 = 5$, $a_1 = 1$, $a_0 = 8$

b. degree 3, $a_3 = -5$, $a_2 = 10$, $a_1 = 0$, $a_0 = 8$

c. degree 2, $a_2 = -1$, $a_1 = 1$, $a_0 = 0$

d. degree 3, $a_3 = 1$, $a_2 = -8$, $a_1 = 15$, $a_0 = 0$

e. degree 1, $a_1 = 1$

f. degree 0, $a_0 = 10$

8-56. Possible equation: $p(x) = 2.5(x + 4)(x - 1)(x - 3)$

8-57. See below:

a. $y = 4x^2 + 5x - 6$

b. $y = x^2 - 5$

8-58. There is no real solution, because a radical cannot be equal to a negative value. If students miss this, they are likely to find the incorrect solution $x = -2$, but should recognize that it is incorrect when they substitute it back in to check.

8-59. See below:

a. C: (3, 7), r: 5

b. C: (0, –5), r: 4

c. C: (–9, 4), r: $5\sqrt{2}$

d. C: (3, 0), r: 1

8-60. See below:

a. $x = \frac{\log 17}{\log 2}$

b. $x = 242$

c. $x = 4$

d. $x = 7$

8-61. See below:

a. $-3 < x < 2$

b. $x \leq -1$ or $x \geq \frac{7}{3}$

8-62. $y = 2 + 4 \sin x$