Lesson 2.1.5

2-64. Some possibilities: $y=-\frac{3}{16}x^2$, $y=-\frac{3}{16}x^2+3$, $y=-\frac{3}{16}(x-4)^2+3$

2-65. See below:

a. A parabola, a quadratic of the form $y=a(x-h)^2+k$

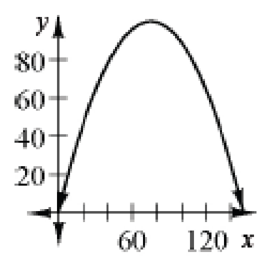
b. The vertex (h, k). Possible equations include $y=ax^2$, $y=a(x-4)^2+3$, $y=ax^2+3$. The equation is not finished, as a value for a is still needed.

c. Strategies vary. $a=-\frac{3}{16}$

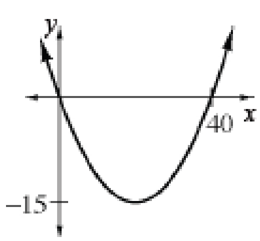
d. Domain and range should include only those values that correspond to the position of the rabbit from the beginning to the end of its jump.

e. Equations will vary depending on the choice of axes location.

2-66. See graph at below. Possibilities include: $y=-\frac{4}{225}x^2+100$, $y=-\frac{4}{225}(x-75)^2+100$, $y=-\frac{4}{225}x^2$

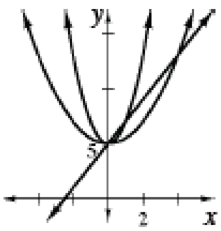


2-67. See possible graph below. $y=\frac{3}{80}x^2-15$ or $y=\frac{3}{80}(x-20)^2-15$ or $y=\frac{3}{80}x^2$ are three possible answers depending on where the axes are placed.



2-69. Possible equations include $y=-\frac{1}{72}(x-60)^2+50$, $y=-\frac{1}{72}x^2+50$, and $y=-\frac{1}{72}x^2$ domain and range should include only those values that correspond to the water passing between the boat and the warehouse.

2-70. See graph below.



a. It is the slope.

b. No, because only lines have (constant) slopes. This 2 is the stretch factor.

2-71. See below:

a. No. Reasons vary, but may include: because there is only one height for each x or because it takes bigger x-values to get bigger y-values.

b. No. Reasons vary, but may include: because the domain is unlimited (any number can be squared).

2-72. See below:

a. $y = 0.25 \cdot 6^x$

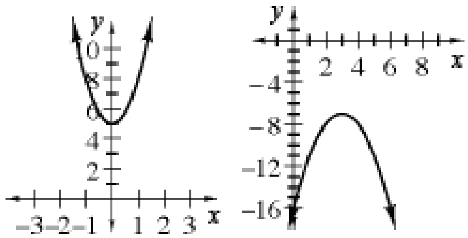
b. $y = 12 \cdot 0.3^x$

2-73. See below:

a. x: (1, 0), $(-\frac{5}{2}, 0)$, y: (0, –5)

b. x: (2, 0), y: none

2-74. See graphs below.



a. stretched parabola, vertex (0, 5)

b. inverted parabola, vertex (3, –7)

2-75. See below:

a. $x = \pm 5$

b. $x = \pm\sqrt{11}$