Review: Chapter 4

Solve the equation using the square root property.

1) $(8s+5)^2 = 49$

2) $7(5x-6)^2 - 3 = 172$

Solve the equation by completing the square.

3) $5x^2 + 10x - 40 = 0$

4) $-3z^2 - 18z + 5 = -1$

5) $4p^2 - 3p - 9 = 0$

6) $m^2 + 4m - 39 = -19$

Solve the equation by using the quadratic formula.

7) $4m^2 - 3m - 5 = 0$

8) $-9x^2 - 3x + 2 = 0$

9) $7x^2 - 4x = -7$

10) $5x^2 = -22x - 8$

11) $3w^2 - w + 14 = 8$

12) $3x^2 - 15 = 0$

Determine the *x*-intercept(s), *y*-intercept, and vertex of the graph of each quadratic equation.

13) $y = -2x^2 + 24x - 40$

14) $y = 2x^2 - 20x + 32$

15) $y = x^2 - 12x + 36$

Determine the vertex and intercepts, then use this information to sketch the graph.

16) $y = x^2 + 6x + 8$.

17) $y = 2x^2 - 16x + 24$.

Solve.

18) NASA launches a rocket at $t = 0$ seconds. Its height, in meters, above sea-level in terms of time is given by the equation $h = -4.9t^2 + 58t + 241$.

a) How high is the rocket after 8 seconds?

b) How high was the rocket when it was initially launched?

Solve.

19) A large explosion causes wood and metal debris to rise vertically into the air with an initial velocity of 128 feet per second. The equation $h = 128t - 16t^2$ gives the height of the falling debris above the ground, in feet, *t* seconds after the explosion.
   a) Use the given equation to find the height of the debris one second after the explosion.
   b) How many seconds after the explosion will the debris hit the ground?

20) If the equation $P = 4 + 5x - 2x^2$ represents the profit, in thousands of dollars, in selling *x* thousand Bassblast speakers, how many speakers should be sold to maximize profit? What is the maximum profit?

21) We are standing on the top of a 512 feet tall building and launch a small object upward. The object's height, measured in feet, after *t* seconds is given by the equation $h = -16t^2 + 224t + 512$.
   a) After how many seconds does the object hit the ground?
   b) What is the highest point that the object reaches?

22) We are standing on the top of a 1024 feet tall building and launch a small object upward. The object's vertical position, measured in feet, after *t* seconds is given by the equation $h = -16t^2 + 192t + 1024$. How long does it take for the object to reach the highest point? What is the highest point that the object reaches?

ANSWERS to Review: Chapter 4

1) $-\frac{3}{2}, \frac{1}{4}$

2) $\frac{11}{5}, \frac{1}{5}$

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3) $2, -4$

4) $-3+\sqrt{11}, -3-\sqrt{11}$

5) $\frac{3+\sqrt{153}}{8}, \frac{3-\sqrt{153}}{8}$

6) $-2+2\sqrt{6}, -2-2\sqrt{6}$

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7) $\frac{3+\sqrt{89}}{8}, \frac{3-\sqrt{89}}{8}$

8) $\frac{1}{3}, -\frac{2}{3}$

9) $\frac{2+3i\sqrt{5}}{7}, \frac{2-3i\sqrt{5}}{7}$

10) $-\frac{2}{5}, -4$

11) $\frac{1+i\sqrt{71}}{6}, \frac{1-i\sqrt{71}}{6}$

12) $-\sqrt{5}, \sqrt{5}$

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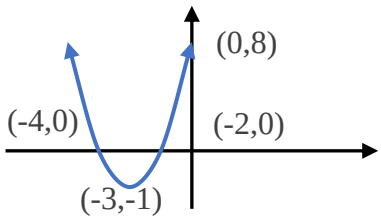
13) y-intercept: $(0,-40)$; x-intercepts: $(2,0), (10,0)$; vertex: $(6,32)$

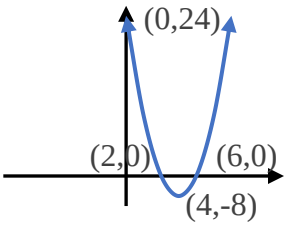
14) y-intercept: $(0,32)$; x-intercepts: $(2,0), (8,0)$; vertex: $(5,-18)$

15) y-intercept: $(0,36)$; x-intercept: $(6,0)$; vertex: $(6,0)$

16)



17)



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18) 391.4 meters; 241 meters

19) 112 feet; 8 seconds

20) 1250 speakers; $7,125

21) 16 seconds; 1296 feet

22) 6 seconds; 1600 feet