**3.5 Solving Quadratic Equations by Completing the Square ⸱ Form B**

**Exampled 1-3**

**Solve each equation by using the Square Root Property.**

**1.** *x*2 – 18*x* + 81 = 49 **2.** 9*x*2 – 12*x* + 4 = 4 **3.**  4*x*2 – 28*x* + 49 = 64

 **4.** 36*x*2 + 12*x* + 1 = 18 **5.** 25*x*2 + 20*x* + 4 = 75 **6.** 25*x*2 – 30*x* + 9 = 96

 **7.** 2*x*2 – 20*x* + 50 = –128 **8.** 2*x*2 + 28*x* + 98 = –200 **9.** 3*x*2 + 24*x* + 48 = –108

**Example 4**

**Find the value of *c* that makes each trinomial a perfect square. Then write the trinomial as a perfect square trinomial.**

 **10.**  *x*2 + 10*x* + *c* **11.** *x*2 + 24*x* + *c* **12.** *x*2 – 9*x* + *c*

**Example 5 and 6**

**Solve each equation by completing the square.**

 **13.** *x*2 – 13*x* + 36 = 0 **14.** *x*2 – 4*x* – 13 = 0 **15.** *x*2 – *x* – 3 = 0

**16.** When the dimensions of a cube are reduced by 4 inches on each side, the surface area of the new cube is 864 square inches. What were the dimensions of the original cube?

**Example 7 and 8**

**Solve each equation by completing the square.**

 **17.** 2*x*2 – 3*x* + 1 = 0 **18.**  25*x*2 + 40*x* – 9 = 0 **19.** 3*x*2 + 2*x* – 1 = 0

 **20.** 2*x*2 – 3*x* + 5 = 0 **21.** *x*2 – 2*x* + 3 = 0 **22.** *x*2 – 2*x* + 4 = 0

**Examples 9 and 10**

**Write each function in vertex form. Find the axis of symmetry. Then find the vertex, and determine if it is a *maximum* or *minimum*.**

 **23.** *y* = *x*2 + 6*x* + 1 **24.** *y* = –*x*2 – 8*x* – 5 **25.** *y* = 3*x*2 + 6*x* – 1

**Example 11**

 **26. DIVING** Malik is participating in a diving championship. For each of his dives, his height above the water can be modeled by a quadratic function. The diving board is 7.5 meters above the water and Malik jumps with a velocity of 4.18 meters per second.

Use$h\left(t\right)=-\frac{1}{2}gt^{2}+vt+h\_{0}$, where *g* = 9.8 $\frac{m}{s^{2}}$.

 **a.** Write a function in vertex form to represent this situation.

 **b.** Find the axis of symmetry and the vertex and interpret their meaning in the context of the situation.

**3.6 Using the Quadratic Formula and the Discriminant ⸱ Form B**

**Example 1**

**Solve each equation by using the Quadratic Formula.**

 **1.** *x*2 +8*x* + 15 = 0 **2.** 12*x*2 – 22*x* + 6 = 0  **3.** *x*2 + 8*x* + 5 = 0

 **4. FOOTBALL** A quarterback throws a football to a receiver. The path of a football can be modeled by the quadratic function *h* = –16*t*2 + 45*t* + 4, where *h* is the height in feet and *t* is the number of seconds after the football is thrown.If the receiver does not catch the ball, how long will it take the football to hit the ground?

**Example 2 and 3**

**Solve each equation by using the Quadratic Formula.**

 **5.** 4*x*2 + 19x – 5 = 0  **6.** 3*x*2 + 5*x* = 2

 **7.** 8*x*2 + 5*x* –1 = 0 **8.** 16*x*2 – 24*x* – 25 = 0

 **9.** *x*2 + 25= 0 **10.** 8*x*2 – 4*x* + 1 = 0

**11.** *x*2 – 14*x* + 53 = 0 **12.** 3*x*2 – 6*x* + 11 = 0

**Examples 4 and 5**

**Find the value of the discriminant for each quadratic equation. Then describe the number and type of roots for the equation.**

**13.** *x*2 – 11*x* – 26 = 0 **14.** 20*x*2 + 7*x* – 3 = 0

 **15.** *x*2 – 6 = 0 **16.** 5*x*2 – *x* – 1 = 0

 **17.** *x*2 + 49 = 0 **18.** 2*x*2 – 3*x* = –2