Module Test B

Fill in the blanks with the terms or numbers to best complete each statement.

1. **Solutions** _____ to equations are also called roots.

2. The **Zero Product** _____ Property states that if $ab = 0$, then $a = 0$ or $b = 0$.

3. A perfect square trinomial is the result of squaring a **binomial** _____.

4. Complete the square. $x^2 - 20x +$ **100** _____

5. When $2x^2 - x - 2 = -5$ is written in standard form, $a =$ **2** _____,

   $b =$ **-1** _____, and $c =$ **3** _____.

Choose the correct response for each of the following:

6. Which of the following is a quadratic equation?

   (a.) $7p(p - 1) = 15$ **b.** $t^2(t^2 - 4) = -8$

   c. $4^2y - 3y + 9 = 0$ **d.** $c^2 - 2c + 5 = c(c + 1)$

7. Solve: $-2x^2 = 98$.

   (a.) $\varnothing$ **b.** $\{-7\}$ **c.** $\{7\}$ **d.** $\{7, -7\}$

8. Solve: $x^2 - 7x - 18 = 0$.

   a. $\{-2\}$ **b.** $\{9\}$ **(c.)** $\{-2, 9\}$ **d.** $\{2, -9\}$

9. Which is the discriminant of $x^2 + 2x + 1 = 0$?

   (a.) 0   **b.** 2   **c.** 4   **d.** 8

10. The height, in feet, of a ball tossed in the air is given by $h = -16t^2 + 10t$, where t is the time in seconds. What is the initial height of the ball?

   a. 16 ft   **(b.)** 15 ft   **c.** 29 ft   **d.** 30 ft

Are the following statements true or false?

11. $(k + 4)^2 = 16$ is a quadratic equation. **True**

12. The solution set of $(x - 2)^2 = 25$ is $\{7, -3\}$. **True**

13. $x^2 - 25x + 50$ is a perfect square trinomial. **False**

14. $x^2 - 4x + 4$ factors into $(x + 2)^2$. **False**

Solve.

15. $-5(x - 1)^2 - 10 = -330$ **{9, –7}**

16. $x^2 + x = 20$ **{4, –5}**

17. $x^2 - 9x + 1 = 15$ $\left[\dfrac{9 + \sqrt{137}}{2}, \dfrac{9 - \sqrt{137}}{2}\right]$

18. $3b^2 - 6 = -5b$ $\left[\dfrac{-5 + \sqrt{97}}{6}, \dfrac{-5 - \sqrt{97}}{6}\right]$

19. The area of a rectangular floor is 96 square feet. The length is eight feet less than four times the width. Find the dimensions of the floor.

width = 6 feet; length = 16 feet

20. A flare is fired into the air from an aircraft that is 150 feet above the ground. The height of the flare is modeled by the equation $h = -16t^2 + 80t + 150$, where h is the flare's height in feet above the ground and t is the time in seconds since it was fired. At what time will the flare be 20 feet above the ground? Round the answer to the nearest hundredth of a second.

6.29 seconds

Answer the following questions with complete sentences.

21. Explain how to solve a quadratic equation by completing the square.

To solve a quadratic equation by completing the square, first isolate the variable terms on the left side of the equation. If the coefficient of the squared term is not one, then make it one by dividing every term in the equation by the leading coefficient. Then, complete the square on the left-hand side by squaring half of the coefficient of the linear or *x*-term and by adding it to both sides of the equation. Factor the trinomial and solve by evaluating square roots.

22. Give an example of each of the following: a quadratic equation with no real number roots, a quadratic equation with one real number root, and a quadratic equation with two real number roots.

Possible answers:

$x^2 + 2x + 4 = 0$ has no real number roots.

$g^2 + 10g + 25 = 0$ has one real number root.

$(y + 9)(y - 2) = 0$ has two real number roots.