NAME _____ DATE _____

Module Test A — Module 13

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. $x^2 - 16x +$ **64**
5. When $x^2 - 5x + 10 = 2$ is written in standard form, $a =$ **1**, $b =$ **–5**, and $c =$ **8**.

Choose the correct response for each of the following:

6. Which of the following is a quadratic equation?

   a. $c^2(c + 1) = 4$ **b.** $-5m(m + 3) = -30$
   c. $6^2p + 10p - 1 = 0$ **d.** $x^2 + 8x - 12 = x(x - 4)$

7. Solve: $-5a^2 = 80$.

   a. $\varnothing$ **b.** $\{-4\}$ **c.** $\{4\}$ **d.** $\{4, -4\}$

8. Solve: $x^2 - 4x - 21 = 0$.

   a. $\{-3\}$ **b.** $\{7\}$ **c.** $\{-7, 3\}$ **d.** $\{7, -3\}$

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.** –6 ft **c.** 0 ft **d.** 10 ft

Are the following statements true or false?

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

12. The solution set of $4x^2 = 15$ is $\left\{\frac{\sqrt{15}}{2}, -\frac{\sqrt{15}}{2}\right\}$. **True**

13. $x^2 - 30x + 225$ is a perfect square trinomial. **True**

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

Solve.

15. $-2(x + 3)^2 + 5 = -67$ **{3, –9}**

16. $x^2 + 6x = 16$ **{2, –8}**

17. $x^2 - 5x + 1 = 8$ $\left\{\frac{5 + \sqrt{53}}{2}, \frac{5 - \sqrt{53}}{2}\right\}$

18. $2d^2 - 4 = -5d$ $\left\{\frac{-5 + \sqrt{57}}{4}, \frac{-5 - \sqrt{57}}{4}\right\}$

19. The area of a rectangular floor is 112 square feet. The length is nine feet more than the width. Find the dimensions of the floor.

width = 7 feet ; length = 16 feet

20. John tosses a ball into the air from a deck that is 40 feet above the ground. The equation $h = -16t^2 + 12t + 40$ models the height of the ball, where h is the ball's height above the ground and t is the time in seconds since the ball was thrown. At what time will the ball be 10 feet above the ground? Round the answer to the nearest hundredth of a second.

1.79 seconds

Answer the following questions with complete sentences.

21. Explain how to solve a quadratic equation by factoring.

To solve a quadratic equation by factoring, first make one side of the equation equal to zero. Next, arrange the terms on the other side of the equation in descending order. Then, factor completely. Set each factor equal to zero and solve those equations.

22. State the discriminant of a quadratic equation. Explain how it is used to determine whether the equation has zero, one, or two real number solutions.

The discriminant of a quadratic equation is the expression $b^2 - 4ac$, which is the radicand in the quadratic formula. If the discriminant is less than zero, then the equation has zero real solutions. If the discriminant equals zero, then the equation has one real solution. If the discriminant is greater than zero, then the equation has two real solutions.