Name_____ Class._____ Date_____

Practice 9-8

Using the Discriminant

Find the number of solutions of each equation.

1. $x^2 + 6x + 10 = 0$

2. $x^2 - 4x - 1 = 0$

3. $x^2 + 6x + 9 = 0$

4. $x^2 - 8x + 15 = 0$

5. $x^2 - 5x + 7 = 0$

6. $x^2 - 4x + 5 = 0$

7. $3x^2 - 18x + 27 = 0$

8. $4x^2 - 8 = 0$

9. $-5x^2 - 10x = 0$

10. $-x^2 = 4x + 6$

11. $4x^2 = 9x - 3$

12. $8x^2 + 2 = 8x$

13. $7x^2 + 16x + 11 = 0$

14. $12x^2 - 11x - 2 = 0$

15. $-9x^2 - 25x + 20 = 0$

16. $16x^2 + 8x = -1$

17. $-16x^2 + 11x = 11$

18. $12x^2 - 12x = -3$

19. $0.2x^2 + 4.5x - 2.8 = 0$

20. $-2.8x^2 + 3.1x = -0.5$

21. $0.5x^2 + 0.6x = 0$

22. $1.5x^2 - 15x + 2.5 = 0$

23. $-3x^2 + 27x = -40$

24. $2.1x^2 + 4.2 = 0$

25. One of the games at a carnival involves trying to ring a bell with a ball by hitting a lever that propels the ball into the air. The height of the ball is modeled by the equation $h = -16t^2 + 39t$. If the bell is 25 ft above the ground, will it be hit by the ball?

26. You are placing a rectangular picture on a square poster board. You can enlarge the picture to any size. The area of the poster board not covered by the picture is modeled by the equation $A = -x^2 - 10x + 300$. Is it possible for the area not covered by the picture to be 100 in.^{2} ?

27. The equation $h = -16t^2 + 58t + 3$ models the height of a baseball t seconds after it has been hit.

a. Was the height of the baseball ever 40 ft?

b. Was the height of the baseball ever 60 ft?

28. A firefighter is on the fifth floor of an office building. She needs to throw a rope into the window above her on the seventh floor. The function $h = -16t^2 + 36t$ models how high above her she is able to throw a rope. If she needs to throw the rope 40 ft above her to reach the seventh-floor window, will the rope get to the window?

Find the number of. *x*-intercepts of the related function of each equation.

29. $-16 = x^2 + 10x$

30. $-5 = x^2 + 3x$

31. $7 = x^2 - 2x$

32. $0 = 3x^2 - 3$

33. $0 = 2x^2 + x$

34. $-1 = 3x^2 + 2x$

35. $4 = x^2 - 8x$

36. $-64 = x^2 - 16x$

37. $6 = -2x^2 - 5x$

38. $2 = -4x^2 - 5x$

39. $36 = -x^2 + 12x$

40. $6 = -5x^2 + 11x$