

Practice 10-7

Using the Discriminant

Find the number of real solutions of each equation.

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| 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.

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

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