

Guided Skills Practice

Complete the square for each quadratic expression to form a perfect-square trinomial. Then write the new expression as a binomial squared.

(EXAMPLE 1)

5. $x^2 - 12x$

6. $x^2 + 5x$

7. Solve $x^2 - 4x - 21 = 0$ by completing the square. (EXAMPLE 2)

8. Solve $2x^2 + 5x = 3$. (EXAMPLE 3)

CONNECTION

9. **TRANSFORMATIONS** Given $g(x) = x^2 + 12x + 20$, write the function in vertex form, and give the coordinates of the vertex and the equation of the axis of symmetry. Then describe the transformations from $f(x) = x^2$ to g . (EXAMPLE 4)

APPLICATION

10. **SPORTS** A softball is thrown upward with an initial velocity of 32 feet per second from 5 feet above ground. The ball's height in feet above the ground is modeled by $h(t) = -16t^2 + 32t + 5$, where t is the time in seconds after the ball is released. Complete the square and rewrite h in vertex form. Then find the the maximum height of the ball. (EXAMPLE 5)

internet connect

Homework
Help Online

Go To: go.hrw.com

Keyword:

MB1 Homework Help
for Exercises 17–37

Practice and Apply

Complete the square for each quadratic expression to form a perfect-square trinomial. Then write the new expression as a binomial squared.

11. $x^2 + 10x$

12. $x^2 - 14x$

13. $x^2 - 8x$

14. $x^2 + 2x$

15. $x^2 + 13x$

16. $x^2 + 7x$

Solve each equation by completing the square. Give exact solutions.

17. $x^2 - 8x = 3$

18. $x^2 + 2x = 13$

19. $x^2 - 5x - 1 = 4 - 3x$

20. $0 = x^2 - 6x + 3$

21. $0 = x^2 + 7x - 26$

22. $0 = x^2 - 3x - 6$

23. $x^2 + 7x + 10 = 0$

24. $x^2 + 10x + 16 = 0$

25. $x^2 - x = 30$

26. $0 = 3x^2 - 2x - 12$

27. $-2x^2 + 14x + 60 = 0$

28. $0 = 3x^2 - 11x + 6$

29. $-10 = x^2 - 8x + 2$

30. $x^2 + 16x = 2$

31. $4 - x^2 = 10x$

32. $x^2 = 23 - 15x$

33. $8x - 2 = x^2 + 15x$

34. $-32x = 16 - x^2$

35. $2x^2 = 22x - 11$

36. $4x^2 - 8 = -13x$

37. $2x^2 - 12 = 3x$

Write each quadratic function in vertex form. Give the coordinates of the vertex and the equation of the axis of symmetry. Then describe the transformations from $f(x) = x^2$ to g .

38. $g(x) = 3x^2$

39. $g(x) = -x^2 + 2$

40. $g(x) = x^2 - 5x$

41. $g(x) = x^2 + 8x + 11$

42. $g(x) = x^2 - 6x - 2$

43. $g(x) = -x^2 + 4x + 2$

44. $g(x) = x^2 + 7x + 3$

45. $g(x) = -3x^2 + 6x - 9$

46. $g(x) = -2x^2 + 12x + 13$

47. Write three different quadratic functions that each have a vertex at $(2, 5)$.