3.9 Exercises

Find all solutions of the following equations

1. $(x - 2)(x - 3) = 0$ **2.** $(m + 4)(m + 5) = 0$ **3.** $(3m - 8)(5m + 6) = 0$

4. $(7y + 4)(3y - 5) = 0$ **5.** $r(r - 4)(2r + 5) = 0$ **6.** $3x(3x - 5)(2x + 7) = 0$

Find all solutions of the following equations by factoring. See Examples 2–4.

7. $x^2 - x - 12 = 0$ **8.** $m^2 + 4m - 5 = 0$ **9.** $y^2 + 9y + 14 = 0$

10. $15r^2 + 7r = 2$ **11.** $12x^2 + 4x = 1$ **12.** $4a^2 + 9a + 2 = 0$

13. $3x^2 - 11x - 20 = 0$ **14.** $2y^2 - 12 - 4y = y^2 - 3y$ **15.** $3p^2 + 9p + 30 = 2p^2 - 2p$

16. $4p^2 + 16p = 0$ **17.** $2a^2 - 8a = 0$ **18.** $6m^2 - 36m = 0$

19. $-3m^2 + 27m = 0$ **20.** $-3m^2 + 27 = 0$ **21.** $-2a^2 + 8 = 0$

22. $4p^2 - 16 = 0$ **23.** $9x^2 - 81 = 0$ **24.** $x(x + 3) = 4$

25. $(x + 4)(x - 6) = -16$ **26.** $(x + 2)(2x + 3) = 10$ **27.** $(w - 1)(3w + 2) = 4w$

28. $y(y + 1) - 4 = -2(y + 3)$ **29.** $2x(x + 2) = x(x - 3) - 12$ **30.** $(r - 5)(r - 3) = 3r(r - 3)$

Solve each of the following word problems by writing a quadratic equation and then solving it. See Example 5.

31. Two numbers have a sum of 6 and a product of -16. Find the numbers.

32. The sum of two numbers is 10. The sum of their squares is 68. Find the numbers.

33. Two numbers have a sum of 12. The sum of the squares of the numbers is 90. Find the numbers.

34. If two integers are added, the result is 15. If the squares of the integers are added, the result is 125. Find the integers.

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1. {2, 3} **3.** {−6/5, 8/3} **5.** {−5/2, 0, 4} **7.** {−3, 4} **9.** {−7, −2}
11. {−1/2, 1/6} **13.** {−4/3, 5} **15.** {−6, −5} **17.** {0, 4} **19.** {0, 9} **21.** {−2, 2}
23. {−3, 3} **25.** {−2, 4} **27.** {−1/3, 2} **29.** {−4, −3} **31.** −2 and 8 **33.** 3, 9
35. −12, −11 and 11, 12 **37.** −11, −9 and 9, 11 **39.** −12 and 6 **41.** Width, 10 meters; length, 14 meters **43.** {−1/2, 6} **45.** {−2/3, 4/15} **47.** {2, 4} **49.** {−3/2, 1/2}
51. $3m^3$ **53.** $-4/(3ab^3)$ **55.** 18/24 **57.** 55/75