Oral Exercises

Read each equation in standard form. Then tell what the values of a, b, and c are for each equation.

1. $3x^2 + 5x - 2 = 0$
2. $3a^2 - 9a + 5 = 0$
3. $2p^2 + 7p - 3 = 0$
4. $5d^2 + 9d = 2$
5. $x^2 - 7x = 4$
6. $y^2 = 6y - 7$
7. $8m^2 = m + 5$
8. $6 - q^2 = 4q$
9. $5x^2 = 7x$
10. $z = 10z^2$
11. $8x^2 = 3$
12. $12t^2 = 0$

Written Exercises

Use the quadratic formula to solve each equation. Give irrational roots in simplest radical form and then approximate them to the nearest tenth. You may wish to use a calculator.

A
1. $x^2 - 3x - 10 = 0$
2. $2s^2 - 3s - 2 = 0$
3. $5z^2 - 11z + 2 = 0$
4. $2y^2 - 6y - 8 = 0$
5. $z^2 - 5z - 6 = 0$
6. $m^2 + 8m + 7 = 0$
7. $x^2 - 6x - 11 = 0$
8. $k^2 - 3k - 1 = 0$
9. $r^2 + 8r + 5 = 0$
10. $n^2 - 6n - 1 = 0$
11. $7x^2 + 2x - 2 = 0$
12. $-2z^2 + 8z + 5 = 0$
13. $-4x^2 + 2x + 3 = 0$
14. $j^2 - 6j = 13$
15. $4y^2 - 12y = -7$
16. $4v^2 = 10v - 5$
17. $3x^2 + 8x = 2$
18. $2r = 5 - 4r^2$

Solve.

B
19. $a^2 + 0.7a - 0.1 = 0$
20. $3x^2 - 1.8x + 0.03 = 0$
21. $4r^2 = 0.6r + 0.5$

22. $t^2 + \frac{3}{2}t + \frac{2}{3} = 0$
23. $2c^2 + \frac{1}{2}c + \frac{2}{3} = 0$
24. $x + \frac{1}{x} = \frac{3}{x} + 3$

25. $\frac{3}{2}x^2 + \frac{1}{3}x + \frac{2}{3} = 0$
26. $\frac{1}{3} - \frac{2}{2y + 1} = \frac{3}{y}$

27. $\frac{3x}{x + 2} - \frac{x + 1}{x - 1} = 0$
28. $\frac{w + 3}{w - 1} - \frac{7}{w + 5} = 3$

The roots of a quadratic equation $ax^2 + bx + c = 0$ are

$$\frac{-b + \sqrt{b^2 - 4ac}}{2a} \quad \text{and} \quad \frac{-b - \sqrt{b^2 - 4ac}}{2a}.$$

C
29. Find the sum of the roots of $ax^2 + bx + c = 0$.
30. Find the product of the roots of $ax^2 + bx + c = 0$.
31. Write a quadratic equation whose roots are $2 \pm \sqrt{5}$. (*Hint:* Find the sum and the product of the roots. Then use the results of Exercises 29 and 30 to find values for a, b, and c.)