

For #1-3, write a quadratic function in standard form for each given set of zeros.

1. 2 and -3

$$x^2 + x - 6$$

2. -6 and -1

$$x^2 + 7x + 6$$

3. $\frac{4}{3}$ and $\frac{2}{5}$

$$15x^2 - 26x + 8$$

For #4-15, solve. Write the solution in simplest radical form.

4. $x^2 - 16x + 48 = 0$

$$x = 12, 4$$

5. $x^2 - 6x = 16$

$$x = 8, -2$$

6. $2x^2 - 8x = 0$

$$x = 0, 4$$

7. $-3x^2 + 15x = 12$

$$x = 4, 1$$

8. $x^2 + 2x + 9 = 0$

$$x = -1 \pm 2i\sqrt{2}$$

9. $2x^2 - 12x + 10 = 0$

$$x = 5, 1$$

10. $3(x - 1)^2 - 1 = 59$

$$x = 1 \pm 2\sqrt{5}$$

11. $6x^2 + 7 = 115$

$$x = \pm 3\sqrt{2}$$

12. $x^2 + 2x - 7 = 14$

$$x = -1 \pm \sqrt{22}$$

13. $x^2 + 2x - 24 = 0$

$$x = -6, 4$$

$$14. x^2 + 20x + 84 = 0$$

$$x = -14, -6$$

$$15. (x + 1)^2 - 2 = -26$$

$$x = -1 \pm 2i\sqrt{6}$$

For #16-18, simplify the square roots.

$$16. \sqrt{-48}$$

$$4i\sqrt{3}$$

$$17. -3\sqrt{-128}$$

$$-24i\sqrt{2}$$

$$18. \sqrt{-256}$$

$$16i$$

For #19-22, find the discriminant, the type and number of solutions for each equation.

$$19. x^2 + 3x + 8 = 0$$

$$-23$$

2 complex

$$20. 2x^2 - 4x + 2 = 0$$

$$0$$

1 real

$$21. -2x^2 - 5x + 3 = 0$$

$$49$$

2 real

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

$$21$$

2 real

For #23-25, solve each inequality. Leave in interval notation.

$$23. x^2 - 8x + 14 < 2$$

$$(2, 6)$$

$$24. 2x^2 - 3x - 9 \geq 0$$

$$(-\infty, -3/2] \cup [3, \infty)$$

$$25. x^2 + 13x + 39 \leq -3$$

$$[-7, -6]$$

For #26-37, perform each indicated operation. Write the result in the form $a + bi$.

26. $(2 - 3i) + (2 - 9i)$

$$4 - 12i$$

27. $(2 + 3i) + (7 + i)$

$$9 + 4i$$

28. $(4 - 3i) - (9 + i)$

$$-5 - 4i$$

29. $(12 - 3i) - (-2i - 9)$

$$21 - i$$

30. $5i(2 + i)$

$$-5 + 10i$$

31. $-2i(3 - 5i)$

$$-10 - 6i$$

32. $(4 + 3i)(2 + 7i)$

$$-13 + 34i$$

33. $(3 + i)(1 + 5i)$

$$-1 + 16i$$

34. i^{13}

$$i$$

35. $-2i^{22}$

$$2$$

36. $\frac{8+2i}{1-3i}$

$$\frac{1+9i}{10}$$

37. $\frac{5+i}{-3i}$

$$\frac{-1+5i}{3}$$