DIRECTIONS: Write in vertex form and find the vertex, axis of symmetry, state how it opens, describe its shape and graph it.

1. $y = -2x^2 - 4x + 2$ **2.** $y = x^2 - 4x + 2$ **3.** $y = \frac{1}{2}x^2 - 4x + 6$

DIRECTIONS: Factor completely.

4. $8x^2 + 2x - 3$ **5.** $2x^2 + 16x + 30$ **6.** $x^2 - 25$ **7.** $9x^2 + 24x + 16$

8. $4x^2 - 5x - 6$ **9.** $6x^2 - 24$ **10.** $4x^2 - 20x + 25$ **11.** $x^2 + 6x + 8$

DIRECTIONS: Simplify.

12. $\sqrt{27}$ **13.** $\sqrt{80}$ **14.** $3\sqrt{2} \bullet 2\sqrt{6}$ **15.** $\sqrt{10} \bullet 3\sqrt{12}$ **16.** $\sqrt{-6} \bullet \sqrt{-4}$

17. $(3 + 9i) + (4 - 2i)$ **18.** $(5 - 2i) - (14 + 6i)$ **19.** $\frac{3}{4+3i}$ **20.** $\frac{2}{5i}$

DIRECTIONS: Solve by completing the square.

21. $x^2 - 12x + 28 = 0$ **22.** $4x^2 + 40x + 280 = 0$

DIRECTIONS: Solve by the quadratic formula.

23. $6x^2 - 8x + 3 = 0$ **24.** $x^2 - 7x + 19 = 0$

DIRECTIONS: Solve by any appropriate method.

25. $x^2 + 4x - 12 = 0$ **26.** $x^2 + 3x - 1 = 0$ **27.** $2(x + 3)^2 = 10$

DIRECTIONS: Find the value of the discriminant and the nature of the roots.

28. $x^2 + 3x - 6 = 0$ **29.** $2x^2 + 5x + 4 = 0$

DIRECTIONS: Find the zeros of the function/*x*-intercepts.

30. $y = x^2 - 18x + 32$ **31.** $y = x^2 - 4x + 10$

DIRECTIONS: Write a quadratic function in vertex form whose graph has the given vertex and passes through the given point.

32. *V*(-3, 2), point (-1, -18) **33.** *V*(6, 1), point (4, 5)

DIRECTIONS: Write a quadratic equation with integral coefficients having the given roots.

34. $1 + \sqrt{3}$, $1 - \sqrt{3}$ **35.** $\frac{1+\sqrt{2}}{3}$, $\frac{1-\sqrt{2}}{3}$ **36.** $3 + i$, $3 - i$