Get Ready

Graph Quadratic Relations of the Form
$y = a(x - h)^2 + k$

1. Sketch each parabola. Label the vertex, the axis of symmetry, and the y-intercept. Use a graphing calculator to check your results.
    a) $y = (x - 3)^2 - 1$
    b) $y = 2(x - 2)^2 - 3$
    c) $y = -3(x + 1)^2 - 2$
    d) $y = -(x + 3)^2 + 4$

2. Sketch each parabola. Label the vertex, the axis of symmetry, and the y-intercept. Use a graphing calculator to check your results.
    a) $y = \frac{1}{2}(x + 4)^2 + 5$

    b) $y = -\frac{1}{3}(x + 1)^2 - 3$

    c) $y = -0.75(x - 3)^2 + 2$
    d) $y = 0.4(x - 2)^2 - 0.6$

Square Roots

3. Find the square roots of each number, where possible. Round to the nearest tenth, if necessary.
    a) 225
    b) 49
    c) −85
    d) 40

4. Use the order of operations to evaluate each expression.
    a) $\pm\sqrt{7^2 + 32}$

    b) $\pm\sqrt{10^2 - 36}$

    c) $\pm\sqrt{8^2 - 4(3)(-3)}$

    d) $\pm\sqrt{7^2 - 4(2)(3)}$

Factor Quadratic Expressions

5. Factor.
    a) $x^2 - 3x - 18$
    b) $4x^2 - 1$
    c) $9x^2 - 30x - 24$
    d) $25x^2 + 70xy + 49y^2$
    e) $18x^2 - 9x - 2$
    f) $-2x^2 + 6x + 56$
    g) $-5x^2 + 70x - 225$
    h) $25x^2 - 1$

6. Factor, if possible.
    a) $2x^2 + 7x + 3$
    b) $6t^2 - 7t - 3$
    c) $2y^2 - 7y + 5$
    d) $10x^2 - x - 2$
    e) $3z^2 - 3z - 4$
    f) $4x^2 - 9$
    g) $4x^2 - 12x + 9$
    h) $2w^2 + 9w + 10$

Translate From Words to Algebra

7. Translate each phrase into an algebraic expression.
    a) three more than five times a number
    b) the difference between x and y
    c) the product of one number and one more than the same number
    d) the average of x and y
    e) the sum of three consecutive even numbers

8. Write an equation to represent each sentence, using two unknowns.
    a) A number is twice a second number.
    b) The sum of Ray's age and Toni's age is 54.
    c) The price of a hamburger is $3 more than half the price of a hot dog.
    d) The width of a rectangle is 5 units less than the length.