Name: _____   Date: _____

Section 6.4 Practice Master

1. Use the quadratic formula to solve each equation. Express answers as exact roots.
   a) $x^2 + 7x + 5 = 0$
   b) $y^2 - 6y + 3 = 0$
   c) $x^2 - 3x + 1 = 0$
   d) $2x^2 - 5x = 0$
   e) $2y^2 + y - 5 = 0$

2. Solve using the quadratic formula. Express answers as exact roots and as approximate roots, to the nearest hundredth.
   a) $x^2 + 5x + 2 = 0$
   b) $x^2 - 3x - 1 = 0$
   c) $x^2 - x - 3 = 0$
   d) $x^2 + 7x + 2 = 0$
   e) $x^2 - 5x - 2 = 0$
   f) $x^2 - x - 4 = 0$
   g) $0 = x^2 + x - 7$
   h) $x^2 - x = 5$

3. Find the x-intercepts, to the nearest hundredth; the vertex; and the equation of the axis of symmetry of each quadratic relation. Sketch the parabola that each relation defines.
   a) $y = 3x^2 + 6x + 4$
   b) $y = -2x^2 + 4x + 7$

4. For each quadratic relation, state the coordinates of the vertex, the direction of opening, and the number of x-intercepts.
   a) $y = (x - 2)^2 + 3$
   b) $y = -2(x + 5)^2 + 4$

5. Sketch a graph representing a quadratic relation with each condition.
   a) two x-intercepts
   b) one x-intercept
   c) no x-intercepts

6. Solve each quadratic equation. Leave your answers as exact roots, if necessary.
   a) $2c^2 - 6c = 7$
   b) $x(2x - 3) = 7$
   c) $3x(x - 4) = (x + 2)^2$
   d) $3y^2 - (5y + 1)(2y - 3) = 3$

7. The hypotenuse of a right triangle measures 20 cm. The sum of the lengths of the legs is 28 cm. Find the length of each leg.

8. A rectangular skating rink measures 30 m by 20 m. It is doubled in area by extending each side of the rink by the same amount. Determine by how much each side was extended.

9. a) Find the width, w, in metres, of the Canadian flag on the Peace Tower in Ottawa by solving the equation $8w^2 + 18w - 81 = 0$.
   b) The height of the Peace Tower is 90 m. If an object is thrown downward from this height at 5 m/s, the approximate time, t, in seconds, the object takes to reach the ground can be found by solving the equation $-5t^2 - 5t + 90 = 0$. Find the time taken, to the nearest tenth of a second.

10. A rectangular piece of tin 50 cm by 40 cm is made into a lidless box of base area 875 cm^2 by cutting squares of equal sizes from the corners and bending up the sides.
    a) Find the side length of each removed square.
    b) Find the volume of the box.

11. Sipapu Natural Bridge is in Utah. Find the horizontal distance, x, in metres, across this natural arch at the base by solving the equation $-0.04x^2 + 3.28x = 0$.