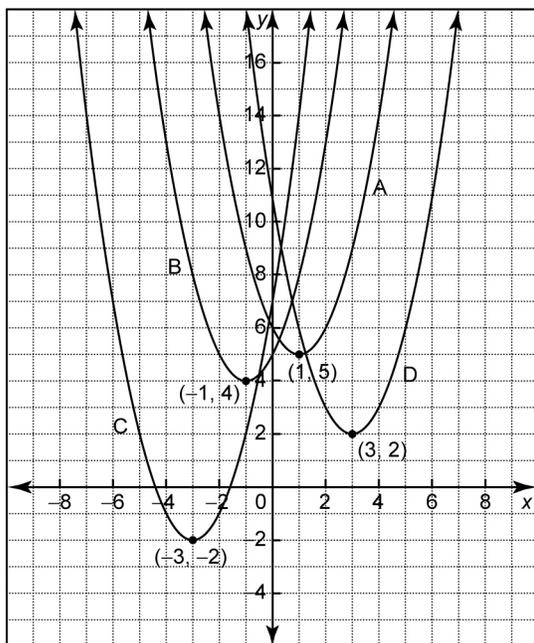Name: _____   Date: _____

Section 6.1 Practice Master

1. Use algebra tiles to rewrite each relation in the form $y = (x - h)^2 + k$ by completing the square.
   a) $y = x^2 + 4x + 5$
   b) $y = x^2 - 10x + 7$
   c) $y = x^2 + 2x + 6$

2. Determine the value of c that makes each expression a perfect square.
   a) $x^2 + 8x + c$
   b) $x^2 + 12x + c$
   c) $x^2 - 20x + c$
   d) $x^2 - 30x + c$

3. Match each graph with the appropriate equation.
   a) $y = (x - 3)^2 + 2$
   b) $y = (x + 1)^2 + 4$
   c) $y = (x - 1)^2 + 5$
   d) $y = (x + 3)^2 - 2$

4. Rewrite each relation in the form $y = a(x - h)^2 + k$ by completing the square. Then, sketch a graph of the relation, labelling the vertex, the axis of symmetry, and two other points on the graph.
   a) $y = 2x^2 - 12x + 22$
   b) $y = -x^2 + 2x + 4$
   c) $y = \frac{1}{2}x^2 + 3x + \frac{5}{2}$
   d) $y = -1.5x^2 + 6x - 5$

5. Find the maximum or minimum point for each parabola by completing the square.
   a) $y = -x^2 + 4x - 4$
   b) $y = 2x^2 + 12x + 17$
   c) $y = -\frac{1}{2}x^2 - 4x - 7$
   d) $y = 3x^2 - 30x + 73$

6. The path of a golf ball can be modelled by the equation $h = -2d^2 + 12d - 13$, where d represents the horizontal distance, in metres, that the ball travels and h represents the height of the ball, in metres, above the ground. What is the maximum height of the golf ball and at what horizontal distance does it occur?

7. Angie sold 1200 tickets for the holiday concert at $20 per ticket. Her committee is planning to increase the prices this year. Their research shows that for each $2 increase in the price of a ticket, 60 fewer tickets will be sold.
   a) Determine the revenue relation that describes the ticket sales.
   b) What should the selling price per ticket be to maximize revenue?
   c) How many tickets will be sold at the maximum revenue?
   d) What is the maximum revenue?