1. Find the coordinates of the vertex for the following quadratics.

   (a) $y = -x^2 + 6x + 3$

   (b) $y = 2x^2 + 5x - 13$

   (c) $y = (x + 5)(x - 3)$

   (d) $y = -3(x - 1)(x + 4)$

2. Graph each of the functions in question 1.

3. Transform the following quadratic equations to vertex form.

   (a) $y = 2x^2 + 5x - 13$

   (b) $y = (x + 6)(x - 3)$

4. A rectangle has dimensions $3x$ and $5 - 2x$.

   (a) What is the maximum area of the rectangle?

   (b) What value of x gives the maximum area?

5. Find the quadratic equation in each case and write in stardard form.

   (a) Vertex is at $(-2, 1)$,

   (b) Vertex is at $(2, 5)$, y-intercept is 7.

   (c) x-intercepts are 2 and -4, contains the point $(3, 14)$.

   (d) x-intercepts are 3 and -6, y-intercept is 9.

   (e) x-intercepts are 0 and 5, contains the point $(1, -6)$.

6. Consider the following number game: "Choose any number and square it. Then, subtract eight times the original number. Then, add 35."

   (a) If x is the original number and y is the result, write an equation that represents the instructions given above.

   (b) Find the smallest possible result and the value of the original number that gives the smallest result.