

## Section 2.1 Quadratic Functions: Exploring Forms

Use the following quadratic functions to answer questions 1 – 5.

**A**  $y = x^2 + 6x + 8$

**B**  $y = (x - 3)^2 + 7$

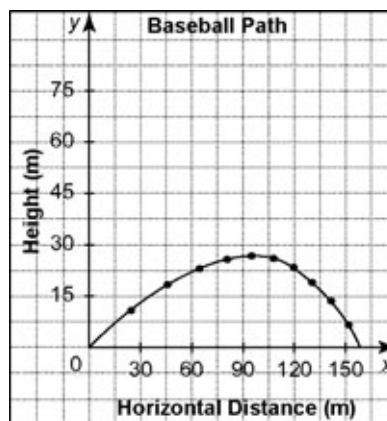
**C**  $y = (x - 3)(x + 5)$

**D**  $y = -2(x + 4)^2 - 1$

**E**  $y = -(x + 1)(x + 5)$

**F**  $y = -x^2 + x - 3$

1. Identify the algebraic form used to express each function: standard form, factored form, or vertex form.
2. For those functions in the standard form, identify
  - a) the values of  $a$ ,  $b$ , and  $c$
  - b) the direction of opening
  - c) whether the vertex is a maximum or a minimum
  - d) the  $y$ -intercept
3. For those functions in the factored form, identify
  - a) the direction of opening
  - b) the  $x$ -intercepts
  - c) the coordinates of the vertex
  - d) whether the vertex is a maximum or a minimum
  - e) the axis of symmetry
  - f) the  $y$ -intercept
4. For those in vertex form, identify
  - a) the direction of opening
  - b) the coordinates of the vertex
  - c) whether the vertex is a maximum or a minimum
  - d) the axis of symmetry
  - e) the  $y$ -intercept
5. a) Sketch a graph of each function, without graphing technology.  
 b) Use graphing technology to help you identify the intervals for which each function is
  - i) positive or negative
  - ii) increasing or decreasing
6. Determine an equation for each quadratic function.
  - a) The  $y$ -intercept is 2 and the vertex is  $(4, -2)$ .
  - b) The  $x$ -intercepts are 3 and 7 and the minimum value is  $-8$ .
  - c) The vertex is  $(-2, 4)$  and one  $x$ -intercept is 0.
7. This graph shows the height–distance relationship of a baseball hit for a home run.



- a) What is the approximate maximum height reached?
- b) What is the approximate distance of the home run?
- c) Write a quadratic function that approximates the trajectory of the home run. (It will not be the same as the graph because the ball falls faster than it rises.)