

Section 5.5

1. Consider the function $f(x) = 2x^2 - 4x - 30$
 - a. What is the vertical intercept? _____
 - b. Determine the zeros of $f(x)$.
 - c. Is the graph of this function concave up or concave down? _____
 - d. Give the coordinates of the vertex. _____
 - e. What is the domain? _____
 - f. What is the range? _____
 - g. Give the equation for the axis of symmetry. _____
 - h. Rewrite this equation in vertex form, $y = a(x - h)^2 + k$ _____

2. Consider the function $f(x) = -2(x + 1)^2 + 3$
 - a. What is the vertical intercept? _____
 - b. Determine the zeros of $f(x)$.
 - c. Is the graph of this function concave up or concave down? _____
 - d. Give the coordinates of the vertex. _____
 - e. What is the domain? _____
 - f. What is the range? _____
 - g. Give the equation for the axis of symmetry. _____
 - h. Write this equation in factored form, $y = a(x - r)(x - s)$. _____

3. Consider the function $f(x) = 3x^2 - x - 4$
- What is the vertical intercept? _____
 - Determine the zeros of $f(x)$. _____
 - Is the graph of this function concave up or concave down? _____
 - Give the coordinates of the vertex. _____
 - What is the domain? _____
 - What is the range? _____
 - Give the equation for the axis of symmetry. _____
 - For what values of x is $f(x)$ decreasing? _____
 - Write this equation in standard form, $y = ax^2 + bx + c$. _____
4. Write the equation of a quadratic function whose graph has a vertex at $(4, 2)$ and a y -intercept of $(0, 6)$.
5. A fastball is hit straight up over home plate. The ball's height, h (in feet), is a function of the time, t (in seconds) since it was hit. $h(t) = -16t^2 + 80t + 4$
- Determine the vertical intercept, and interpret its meaning in a complete sentence.
 - When will the ball reach its maximum height? _____
 - Determine the maximum height of the ball. _____
 - When does the ball hit the ground? Round your answer to two decimal places and include units.