Name: _____ Date: _____

Chapter 7 Mid Chapter Review Homework

1. Simplify.
   a. $(y^3 – 7x^4y^4) + (-10x^4y^3 + 6y^3 + 4x^4y^4) – (x^4y^3 + 6x^4y^4)$
   b. $(n^2 + 6n – 4)(2n -4)$
   c. $2(3x + 7)^2$
   d. $(x – 3)(x + 6)(2x – 1)$

2. Factor each expression completely.
   a. $2x^2 – 10x + 12$
   b. $2x^2 + 7x + 3$
   c. $x^3 – 10x^2 – 24x$

3. Solve each equation by setting it equal to zero and factoring.
   a. $x^2 – 8x = 9$
   b. $x^4 – 2x^3 = 15x^2$

4. Tell whether each equation is written in general form, vertex form, or factored form. Write each equation in the other two forms, if possible.
   a. $Y = 2(x -2)^2 -16$ b. $y = -3(x – 5)(x + 1)$ c. $y = x^2 + 3x – 2$
   d. $Y = (x + 1)(x – 3)(x + 4)$ e. $y = 2x^2 + 5x – 6$ f. $y = -2 – (x + 7)^2$

5. Sketch a graph of each function. Label all zeros and the coordinates of all maximum or minimum points.
   a. $Y = 2(x – 2)^2 – 16$ b. $y = -3(x – 5)(x + 1)$ c. $y = x^2 – 3x + 2$

6. An object is 49000 ft above the ground. The object falls, and its height is given by the quadratic function $h(t) = -16t^2 + 4900$. The height of the object above the ground is in feet and the time, t, is in seconds. Determine when the object hits the ground.

7. A model rocket is launched from the top of a cliff that is 384 feet high with an upward speed of 160 ft/s.

   a. Write a specific function that represents the height of the rocket as a function of the time.
   b. How many seconds after the launch does the rocket reach its maximum height?
   c. Determine the maximum height attained by the rocket to the nearest foot.
   d. How many seconds after the launch does the rocket reach the ground?

8. A juggler tosses a ball into the air. The ball leaves the juggler's hand 5 feet above the ground and has an initial velocity of 31 feet per second.
   a. Write an equation that represents the height of the ball as a function of time.
   b. How long will it take the ball to reach its maximum height?
   c. If the juggler catches the ball when it falls back to a height of 3 feet, then how long will the ball e in the air?