Graphing Projectile Motion (Assignment 6)

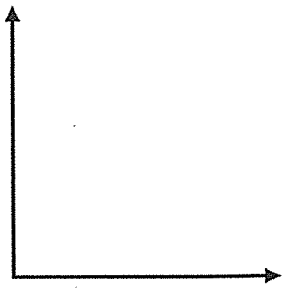
A ball is tossed straight up into the air with a velocity of 30 feet per second from a height of 6 feet.

1. Write an equation that relates the height of the ball in feet, *h*, to the time since the ball was thrown in seconds, *x*.

2. How long after the ball was thrown does it reach its maximum height?

3. What is the maximum height of the ball?

4. Make a rough sketch of the parabola by first plotting the *y*-intercept and the vertex. You do not need to calculate the *x*-intercept. Label your axes.



5. Use your sketch to estimate how long the ball is in the air before it hits the ground.

The height of a projectile is described by the equation $h = -16t^2 + 352t + 45$.

6. When does the projectile reach its maximum height?

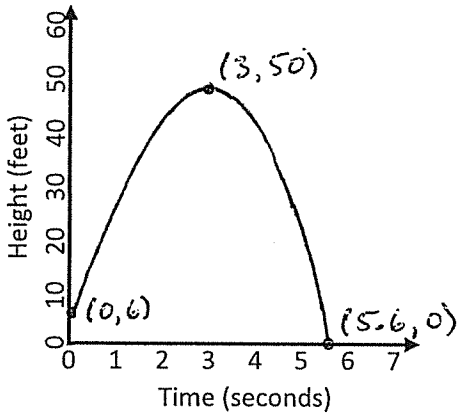
7. What is the maximum height of the projectile?

The height of a projectile is described by the equation $h = -16t^2 - 54t + 168$.

8. Calculate the *x*-value of the vertex of the parabola given by the equation.

9. Based on your answer to question 8, when do you think the projectile reaches its maximum height, and what is its maximum height? Explain.

10. Use the graph below to determine each coefficient.



Initial Height = Initial Velocity = Acceleration due to Gravity =

11. Write the equation in standard form for the parabola given in the graph above.

12. Describe a <u>real-world situation</u> that could be represented by your equation. In your description, include initial height, initial velocity, maximum height, and total time in the air.