

**Math 3206**  
**Worksheet 1**  
**Maximum and Minimum Problems**

1. Sylvie does a reverse summersault dive from a three-meter springboard. Her height after she leaves the springboard is given by the equation  $h = -4.9t^2 + 8.8t + 3$ , where  $h$  is her height in meters and  $t$  is the time in seconds.
- A) What kind of function is displayed? \_\_\_\_\_
  - B) What kind of graph will be displayed? \_\_\_\_\_
  - C) What kind of vertex will the graph have? \_\_\_\_\_
  - D) Determine the height of the springboard above the water.
  - E) Algebraically determine the maximum height that Sylvie will reach. (Hint: Find the vertex)
  - F) At what time did she reach the maximum height? \_\_\_\_\_
2. On a forward summersault dive, Greg's height,  $h$ , in meters above the water is given by the equation  $h = -5t^2 + 6t + 3$ , where  $t$  is the time in seconds after he leaves the board.
- A) Algebraically determine the maximum height reached by Greg. (Find Vertex)
  - B) At what time did Greg reach his maximum height? \_\_\_\_\_
3. A ball is thrown vertically into the air. Its height,  $h$ , above the ground in meters after a time,  $t$ , in seconds is given by the equation  $h(t) = -5t^2 + 18t$ .
- A) What was the initial height of the ball? How do you know?

B) What was the maximum height of the ball?

C) When did the ball reach its maximum height?

4. A ball is thrown into the air from the balcony of an apartment building and falls to the ground. The height,  $h$ , in meters, of the ball relative to the ground  $t$  seconds after being thrown is given by the equation  $h = -5t^2 + 10t + 35$ .

A) What was the height of the balcony from which the ball was thrown?

B) Find the vertex.

C) Interpret your vertex. (complete the following statement)

The \_\_\_\_\_ height of the ball was \_\_\_\_\_ and it occurs at \_\_\_\_\_.

5. The rate of fuel consumption of an aircraft,  $f$ , in liters per hour, is given by the equation  $f = 0.01v^2 - 5v + 1000$ , where  $v$  is the speed in kilometers per hour.

A) What kind of vertex will the graph have?

B) What is the minimum amount of fuel consumed?

C) At what speed does the minimum fuel consumption occur?

