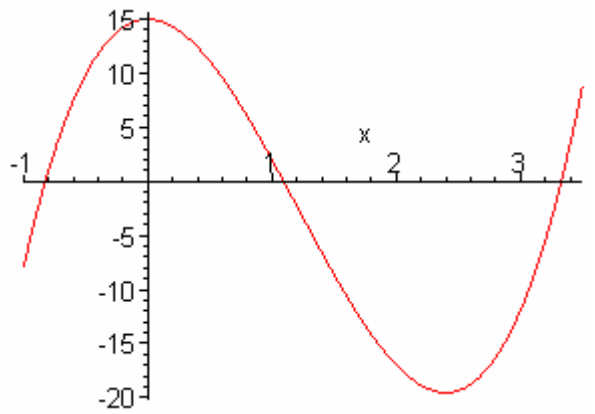
4/17/2006 MATH261 Calculus I Name:_____

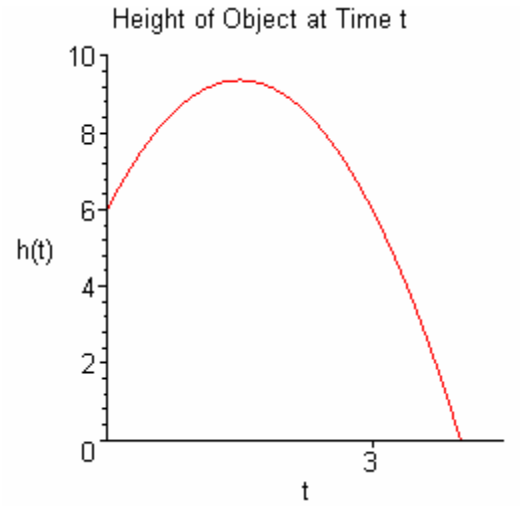
Dr. Lunsford Quiz 11 (20 Points Total)

You must neatly show all work for any credit on these problems.

I. Below you are given the graph of $f(x) = 5x^3 - 18x^2 + 15$ for reference. Find all intervals on which f is concave down and on which f is concave up. (6 points)



II. At time $t = 0$ seconds a lightweight ball is thrown straight up. The height of the ball as measured from the ground (in feet) is $h(t) = -\frac{3}{2}x^2 + \frac{9}{2}x + 6$ where t is in seconds. Below is the graph of the height function. At what time will the ball reach its maximum height? You should clearly justify why this is a maximum. (6 points)



(b) At what time will the ball hit the ground? (2 points)

III. Use calculus to find the dimensions of a rectangle with perimeter of 100 meters whose area is as large as possible. Clearly indicate your answers. (6 points)