TEST 2:

HW:

Extra Credit in class:

The Final Grade for TEST 2:

I. (10%) Find the point(s) of the curve $y = e^x(x^2 + 1)$, where the tangent line is horizontal.

II. (10%) Had Galileo dropped a cannonball from the tower of Pisa, 179ft above the ground, the ball's height aboveground t seconds into the fall would have been

$$s(t) = 179 - 16t^2.$$

a) What would have been the ball's velocity and acceleration at time t?
b) About how long would it have taken the ball to hit the ground (s=0)?
c) What would have been the ball's velocity at the moment of impact?

III. (10%) Find the derivative of the function:

$$f(x) = \frac{2x+1}{x^2-1}.$$

IV. (10%) Find the derivative of the function:

$$f(x) = \cos x + \sin x + \tan x.$$

V. (10%) Find the derivative of the function:

$$f(x) = \frac{\sin x}{1 + \cos^2 x}.$$

VI. (10%) Find the derivative of the function:

$$f(x) = (3x + 4)^7 + \cos 6x.$$

VII. (10%) Find the derivative of the function:

$$f(x) = \left(\frac{\sin x}{1 + \cos x}\right)^3.$$

VIII. (10%) Find the derivative of the function:

$$f(x) = \sqrt{1 + \sin^3(5x)}.$$

IX. (10%) A function $y = f(x)$ is graphed below.

a) Estimate as good as you can the intervals where $f'(x)$ is positive and where $f'(x)$ is negative.

b) Estimate as good as you can the intervals where $f''(x)$ is positive and where $f''(x)$ is negative.

c) Sketch the graph of $f'(x)$ (on the same figure).

X. (10%) The figure shows the graphs of f, f', f''. Identify each curve, and explain your choices.