↑↑ Last Name ↑↑ , ↑↑ First Name ↑↑

Math 163A Homework Set #4

Due Friday, May 9, 2008

Problem:	1	2	3	4	5	Total
Score:						
Possible:	5	5	5	5	5	25

[1] (based on suggested problems 4.1#19 and 4.3#37)

The goal is to find the derivative of $f(x)=\frac{7}{x^5}$ using two different methods.

(a) Find $f'(x)$ using the quotient rule. Show your work clearly and simplify your answer.

(b) Start over. Observe that f can be rewritten $f(x)=7x^{-5}$. Find $f'(x)$ again, this time using the constant multiple rule and the power rule. Show your work clearly and simplify your answer.

(c) Compare your answers to (a) and (b). Are they the same? (If they are not the same, check for errors and also check to see if one answer can be simplified to a form that matches the other answer.)

[2] (based on suggested problem 4.3#45) Let $f(x)=\sqrt{x+4}$.

(a) Find the equation of the line that is tangent to the graph of f at x = -3. Present the equation in slope-intercept form. Show your work clearly.

(b) Sketch a graph of f. (Not the graph of f'.) Make your graph large and neat, and be sure to put coordinates on the axis intercepts.

(c) On your graph, draw the tangent line from part (a). Be sure to put coordinates on the point of tangency and on the points where the tangent line intersects the axes.

[3] (Based on suggested problems 4.1#37 and 41) Let $f(x)=2x^3-3x^2-12x+5$.

(a) Find the x-coordinates of all points on the graph of f where the tangent line is horizontal.

(b) Find the y-coordinates of those same points.

(c) Find the x-coordinates of all points on the graph of f where the slope of the tangent line is m = 24.

(d) Find the y-coordinates of those same points.

[4] (Based on suggested problem 4.1#45)

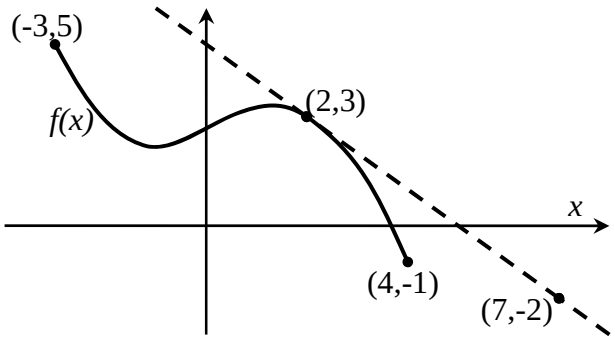
In the picture at right, the graph of f is the solid curve. A tangent line is dotted.

(a) What is the domain of f ? Explain.

(b) What is the range of f ? Explain.

(c) What is the value of $f(2)$? Explain.

(d) What is the value of $f'(2)$? Explain.



[5] (based on suggested problems 4.1#53 and #54) A company makes wagons.

The cost (in dollars) of producing x wagons is $C(x)=.25x^2+5x+30$.

The selling price (in dollars) of a wagon is given by $p(x)=\frac{3000}{x^2}+200$.

(a) Find the Revenue function, $R(x)$. Explain.

(b) Find the marginal revenue. Show your work and explain.

(c) What is the marginal revenue when the demand is 5? Show your work and explain.

(d) What is the marginal profit when the demand is 5? Show your work and explain.