Math 1A (7:30am – 8:20am)
Quiz 3
Fri Oct 17, 2008

SCORE: ___ / 20 POINTS

What day of the month is your birthday ? ___ ___
What are the last 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED

Complete the following definition: SCORE: ___ / 3 POINTS

The derivative of the function f is $\lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$ (1, 2)

Use the definition of the derivative to find the derivative of $f(x) = \dfrac{3}{1-2x}$. SCORE: ___ / 5 POINTS

NO DIFFERENTIATION SHORTCUTS ALLOWED.

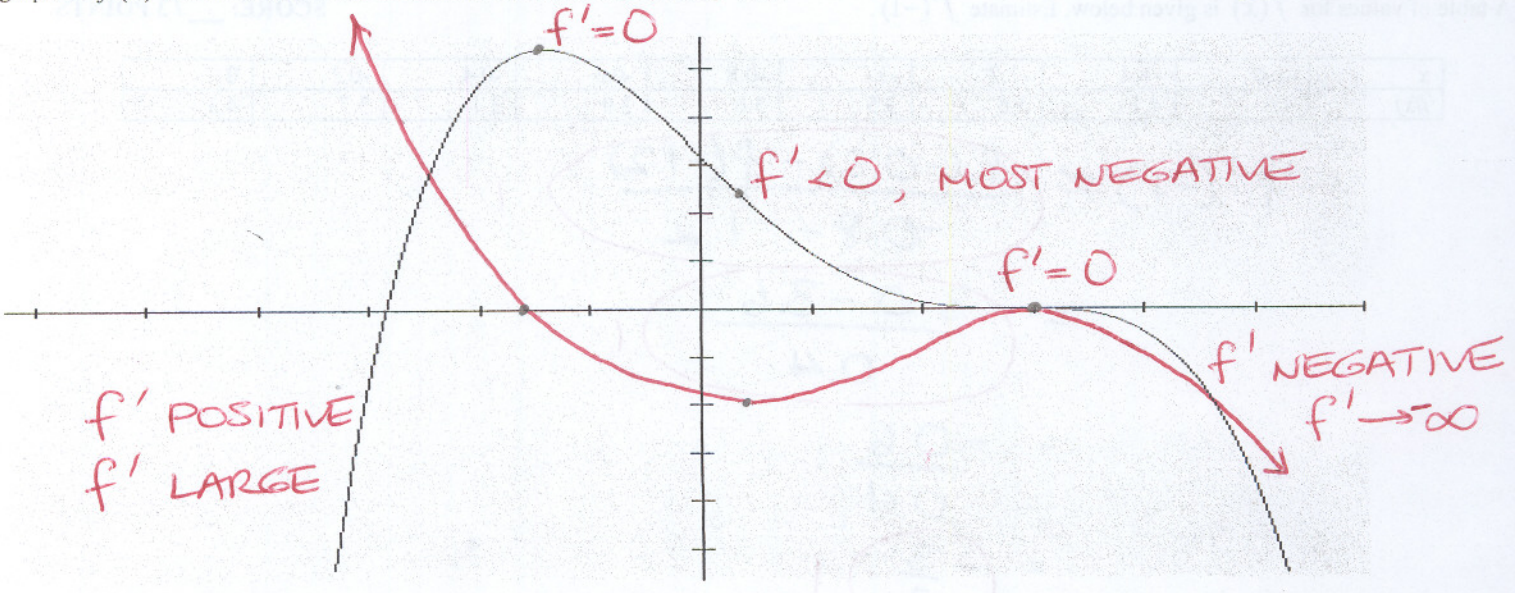
$$f'(x) = \lim_{h\to 0} \frac{\frac{3}{1-2(x+h)} - \frac{3}{1-2x}}{h} \quad (2)$$

$$= \lim_{h\to 0} \frac{3(1-2x)-3(1-2(x+h))}{h(1-2(x+h))(1-2x)} \quad (1)$$

$$= \lim_{h\to 0} \frac{3-6x-3+6x+6h}{h(1-2(x+h))(1-2x)} = \lim_{h\to 0} \frac{6}{(1-2(x+h))(1-2x)} \quad (1)$$

$$= \frac{6}{(1-2x)^2} \quad (1)$$

The graph of $f(x)$ is shown below. On the same axes, sketch a graph of $f'(x)$. SCORE: ___ / 4 POINTS



QUESTIONS ON OTHER SIDE

Use the definition of the derivative to find the derivative of $f(x) = \sqrt{4-3x}$.

SCORE: ___ / 5 POINTS

NO DIFFERENTIATION SHORTCUTS ALLOWED.

$$f'(x) = \lim_{h\to 0} \frac{\sqrt{4-3(x+h)} - \sqrt{4-3x}}{h} \quad 2$$

$$= \lim_{h\to 0} \frac{4-3(x+h)-(4-3x)}{h\left(\sqrt{4-3(x+h)} + \sqrt{4-3x}\right)} \quad 1$$

$$= \lim_{h\to 0} \frac{4-3x-3h-4+3x}{h\left(\sqrt{4-3(x+h)} + \sqrt{4-3x}\right)} = \lim_{h\to 0} \frac{-3}{\sqrt{4-3(x+h)} + \sqrt{4-3x}} \quad 1$$

$$= \frac{-3}{2\sqrt{4-3x}} \quad 1$$

A table of values for $f(x)$ is given below. Estimate $f'(-1)$.

SCORE: ___ / 3 POINTS

x	-1.6	-1.4	-1.2	-1	-0.8	-0.6	-0.4	-0.2	0
$f(x)$	4.9	4.1	3.6	3.5	3.0	2.9	3.1	3.7	4.3

$$f'(-1) \approx \frac{f(-0.8) - f(-1.2)}{-0.8 - -1.2} \quad 1$$

$$= \frac{3.0 - 3.6}{0.4} \quad 1$$

$$= \frac{-0.6}{0.4}$$

$$= -\frac{3}{2} \quad 1$$