Math 157 - Quiz 4
September 24, 2014

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) We will see later that the derivative of $f(x) = 1/x$ is given by $f'(x) = -1/x^2$. Use this to find an equation of the line tangent to the graph of f at the point where $x = 2$.

Slope: $m = f'(2) = -\frac{1}{4}$

Point: $x = 2 \Rightarrow y = f(2) = \frac{1}{2}$

$\Rightarrow$ $\boxed{y - \frac{1}{2} = -\frac{1}{4}(x-2)}$

OR

$\boxed{y = -\frac{1}{4}x + 1}$

2. (2 points) The table belows gives the values of the function g at selected points. Find a reasonable approximation for $g'(1)$.

x	0.8	0.9	1.0	1.1	1.2
$g(x)$	1.67	1.85	2.03	2.21	2.38

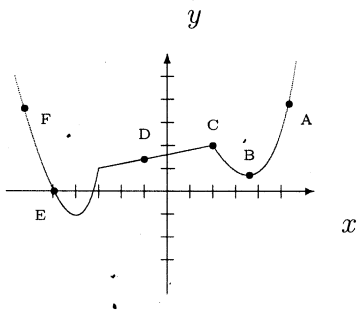
$\frac{g(1.1) - g(1)}{1.1 - 1} = \frac{2.21 - 2.03}{0.1} = 1.8$

$\frac{g(0.9) - g(1)}{0.9 - 1} = \frac{1.85 - 2.03}{-0.1} = 1.8$

A good estimate for $g'(1)$ is 1.8

$\boxed{g'(1) \approx 1.8}$

3. Consider the function f whose graph is shown below.



Referring to the labeled points, find a point at which

(a) $f'(x) = 0$

B

(b) $0 < f'(x) < 1$

D

(c) $f'(x) > 1$

A

(d) $f(x) = 0$

E

(e) $f'(x) < 0$

E, F

(f) (1 pt ex cred) $f'(x)$ is not defined

C