Mathematics 122

Quiz # 8 Name: key

You must show your work to get full credit.

1. Let $f(x)$ be a function with $f(10) = 12$ and $f'(10) = -3$.

(a) What is the equation of the tangent line to $y = f(x)$ at the point where $x = 10$.

$y = f(a) + f'(a)(x-a)$
$= 12 - 3(x-10)$
$= 12 - 3x + 30$
$= -3x + 42$

Equation is $y = 12 - 3(x-10)$ or $y = -3x + 42$

(b) Estimate $f(10.2)$.

$f(10.2) \approx$ 11.4

use the tangent line equation to approximate
$f(10.2) \approx 12 - 3(10.2 - 10)$
$= 12 - 3(.2) = 11.4$

(c) Estimate $f(9.9)$.

$f(9.9) \approx$ 12.3

$f(9.9) \approx 12 - 3(9.9 - 10)$
$= 12 - 3(-.1)$
$= 12.3$

2. Draw graphs of the following:

(a) A function with $f' > 0$ and $f'' < 0$

(b) A function with $f' > 0$ and f is concave up.