3450:221 Calculus, Kreider

Name: _____

Quiz 12, section 4.2

$a = 0$

1. (5 pts) A function $f(x)$ has $f(0) = 2$ and $f(b) = 7$. Use the Mean Value Theorem to find the value b so that there is a point c in the interval $[0, b]$ for which $f'(c) = 2$.

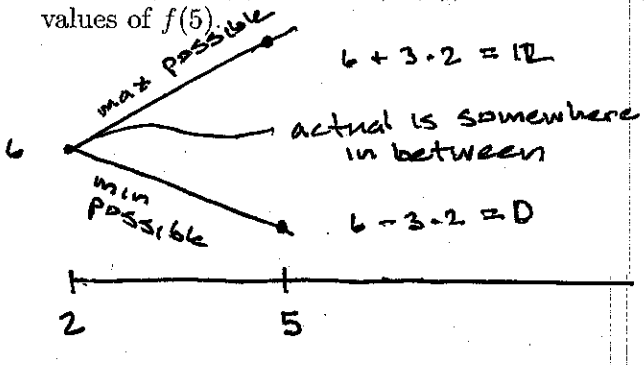
$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

$$2 = \frac{7 - 2}{b - 0}$$

$$2b = 5$$

$$b = 5/2$$

2. (5 pts) If $f(2) = 6$ and $|f'(x)| \leq 2$ for $x \geq 2$, find the maximum and minimum possible values of $f(5)$.



$$f(x) = f(a) + f'(a)(x - a)$$

$a = 2$, $f(a) = 6$

max: $f'(a) = 2$

$f(x) = 6 + 2(x - 2)$

$f(5) = 6 + 2(5 - 2)$

$= 12$

min: $f'(a) = -2$

$f(x) = 6 - 2(x - 2)$

$f(5) = 6 - 2(5 - 2)$

$= 0$