Quiz 3

Markay M.

1.

a $C(x) = 1200 - 50x^2 = \frac{d}{dx}1200 - \frac{d}{dx}50x^2$

$C(x) = \frac{dC}{dx} = 0 - 100x \rightarrow \frac{dC}{dx} = -100x \rightarrow dC = -100x(dx)$

1b $dC = -100(3.50)(dx) \rightarrow -350dx$

$dC = -100(3.70)(dx) \rightarrow -370dx$

1c $1200 - 50(350)^2 \rightarrow 587.50$ pounds

$1200 - 50(3.70)^2 \rightarrow 515.50$ pounds $\rightarrow$ difference = 72 pounds

2.a $X = 550 - 25p \rightarrow \frac{-550}{-25}$ $p = 22$ $x \geq 22$

b $l(x) = xp = xf(x)$

c $l(x) = xp = x(550 - 25p) \rightarrow \left(\frac{-550 + x}{25}\right) \rightarrow \left(\frac{550 - x}{25}\right)$

$l(x) = xf(x) = x\left(\frac{-x + 550}{25}\right) = \frac{-x^2 + 550x}{25}$

$l'(x) = \frac{-2x + 550}{25}$

$l'(100) = \frac{-2(100) + 550}{25} \rightarrow \frac{-200 + 550}{25} \rightarrow \frac{350}{25}$

$14

3a $C(x) = 1000 + 50x - .5x^2$ → average cost $C'(x) = \frac{C(x)}{x}$ | marg $\frac{d}{dx}\left(\frac{C(x)}{x}\right)$

- $\frac{d}{dx}\left(\frac{1000 + 50x - .5x^2}{x}\right) \rightarrow \frac{d}{dx}\left(\frac{1000}{x}\right) + \frac{d}{dx}\left(\frac{50x}{x}\right) + \left(\frac{.5x^2}{x}\right)$

- $\frac{d}{dx}\left(1000^{-1}\right) + \frac{d}{dx}\left(50\right) + \frac{d}{dx}\left(-.5x\right)$

- $\boxed{-1000x^{-2} - .5}$

b $\overline{C}(10) = 145$; $\left(\frac{1000 + 50(10) - .5(10)^2}{10}\right)$

- $\frac{1000 + 500 - 50}{10} \rightarrow \frac{1500 - 50}{10} = \frac{1450}{10} \rightarrow$ 145

c. $C'(10) = 10.50$
$\overline{C}(10) = 145$ → $\overline{C}(10) - \overline{C}'(10)$

$145 - 10.50$

$134.50 per 11 items