Mathematics 122

Quiz 24 Name: Key

You must show your work to get full credit.

1. Let $C(q)$ represent the cost, $R(q)$ the revenue, and $\pi(q)$ the total profit, in dollars, of production q items.

(a) If $C'(50) = 75$ and $R'(50) = 84$, approximately how much profit is earned by th 51^{st} item?

$\pi'(50) = R'(50) - C'(50)$
$= 84 - 75$
$= 9$

Profit is $9.00

(b) If $C'(90) = 71$ and $R'(90) = 68$ approximately how much profit is earned by the 91^{st} item?

$\pi'(90) = R'(90) - C'(90)$
$= 68 - 71$
$= -3$

Profit is -$3.00

(c) If $\pi(q)$ is a maxim when $q = 78$, how do you think $C'(78)$ and $R'(78)$ compare? Explain.

$C'(78) = R'(78)$

Because $\pi(8) = R(8) - C(8)$.
At a maximum the derivative is $= 0$.
So
$0 = \pi'(78) = R'(78) - C'(78)$
which implies $C'(78) = R'(78)$