Mathematics 122

Quiz 23 Name: Key

You must show your work to get full credit.

Revenue is given by $R(q) = 450q$ and cost is given by $C(q) = 10{,}000 + 3q^2$.
(a) At what quantity is profit maximized?

Profit is
$\pi(q) = R(q) - C(q)$
$= 450q - (10000 + 3q^2)$
$= -3q^2 + 450q - 10000$
$\pi'(q) = -6q + 450 = 0$
$q = \frac{450}{6} = 75$

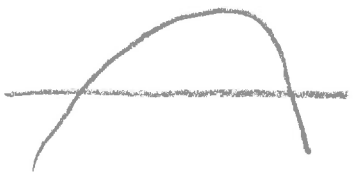
Maximizing quantity is $q =$ 75

(b) What is the total profit at this production level?

Total profit is $6875.00

$\pi(75) = -3(75)^2 + 450(75) - 10000$
$= 6875$

Calculator method
Y1 = -3X^2 + 450X - 10000
Xmin = 0
Xmax = 150
Zoom Fix



2nd Calc maximum
X = 75, Y = 6875
↳ my calculator gave X = 74.999987, but 75 is better answer