Answer to Question #88266 – Math – Calculus

Question

a manufacturer knows that if x hundred of products are demanded in a particular week his total cost function would be TC=14+3x and the corresponding revenue function TR+19x-2x2
derive the profit function
find the breakeven point
calculate the level of demand that maximizes the profit of the company and hence calculate the maximum profits

Solution

Cost function

$C.F = 14 + 3x$

Revenue function

$R.F = 19x - 2x^2$

Thus Profit function

P.F=Revenue Function-Cost function

$P.F = 19x - 2x^2 - 14 - 3x$

For breakeven point

Revenue function=cost function

$19x - 2x^2 = 14 + 3x$

$2x^2 - 16x + 14 = 0$

2x(x-1)-14(x-1)=0

(x-1)(2x-14)=0

x-1=0 or 2x-14=0

x=1 or 2x=14

x=1 or x=7

we get

x=1; 7

Both value of x are the break even points

Now compute the maximum value of profit

Set derivative of profit function to be equal to zero

Thus 19-4x-3=0

We get x=4

The maximum value of profit is

$(19\times 4)-(2\times 4^2)-14-(3\times 4)$

=18

at x=4.