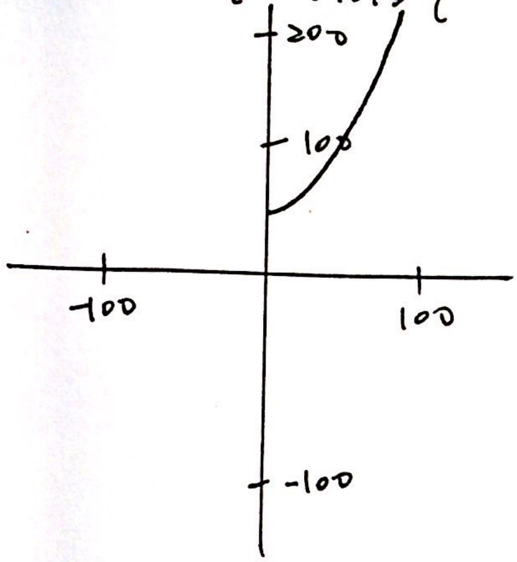
Chia-ting Chen

1-a) The quantity produced (q) can not be achieved to take any Value. since q cannot take a negative Value since the quantity cannot be measured from such direction. The cost function has the y intercept point and no x-intercept point. The domain of this cost function is (-116.3 to 133.3)

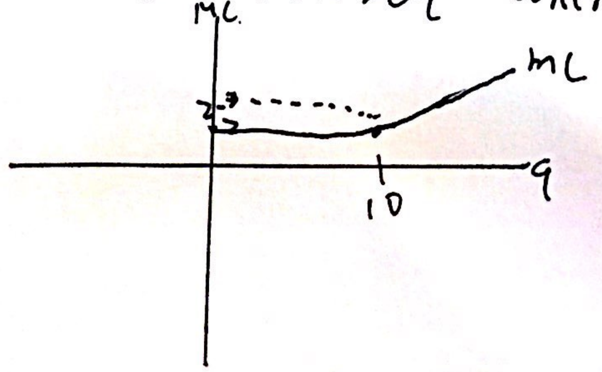
b) $C(q) = 75 + 2q + 0.015q^2$



c) The graph of $C'(q)$ is an increasing function since as q increases, so does $C'(q)$

$C(q) = 75 + 2q + 0.015q^2$

$C'(q) = 2 + 0.030q$ where $C'(q)$ is the marginal cost



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d) The cost of production of 99 widgets will be

$C(q) = 15 + 2q + 0.015q^2$

$C(q) = 15 + 2(99) + 0.015(99)^2$

$= 15 + 198 + 147.015$

$= 420.015$

$C(q) = 420.015$

e) Total cost is given by TFC + TVC

$C(q) = 15 + 2q + 0.015q^2$

than q(0)

$C(0) = 15 + 2(0) + 0.015(0)^2$

$F\,C(q) = 15$

f) $F\,C(q) = 2q + 0.015q^2$

$C(q) = 15 + 2q + 0.015q^2$

$C(q+1) = 15 + 2q + 2 + 0.015q^2 + 0.015 + 0.03q$

$C(q+1) = 2.03q + 17.015 + 0.015q^2$

g) $MC(q) = \dfrac{C(q+q) - C(q)}{(q+1) - q} = C(q+1) - C(q)$

$MC(q) = 2.03q + 17.015 + \cancel{0.015q^2} - 15 - 2q - \cancel{0.015q^2}$

$MC(q) = 0.03q + 2.015$

h) $MC(q) = 0.03q + 2.015$

For $q = 100$

$MC(100) = 0.03(100) + 2.015$

$= 5.015$

i)

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The slope of the Tangent to $C(q)$ at $q=100$ is approximately 5

j) Units of $MC(q)$ are cost per unit (dollars per widget)

2 a) $$\frac{y-C(99)}{x-99} = \frac{C(101)-C(99)}{101-99}$$

so, we get equation as $y=5x-99 \cdot 5+C(99)$

So slope of line is: 5

b) This answer is very close to the answer in question 1-part i