

- Sec 12.4: Applications of the integral.

8 A certain firm's marginal cost for a product is  $\overline{MC} = 6X + 60$ , its marginal revenue is  $\overline{MR} = 180 - 2X$ , and its total cost of production of 10 items is 1000\$. *اعلى ربح*

a) Find the optimal level of production.

$$\overline{MR} = \overline{MC}$$

$$180 - 2X = 6X + 60$$

+2X    +2X

$$180 = 8X + 60 \rightarrow \frac{120}{8} = \frac{8X}{8}$$

-60                    -60

$$\therefore X = 15 \text{ units}$$

b) Find the profit function

$$P(x) = R(x) - C(x)$$

$$\rightarrow R(x) = \int (180 - 2x) dx$$

$$= 180x - \frac{2x^2}{2} + C$$

$$= 180x - x^2 + C$$

to find C:  $R(0) = 0$  *عند*

$$0 = C$$

$$\therefore R(x) = 180x - x^2$$