

26] If the profit function for a commodity is  $P = 6400X - 18X^2 - \frac{1}{3}X^3 - 40000$ , selling how many units will result in a max. profit? Find the max. profit?

$$P'(x) = 6400 - 36X - \frac{1}{3} \cdot 3X^2$$

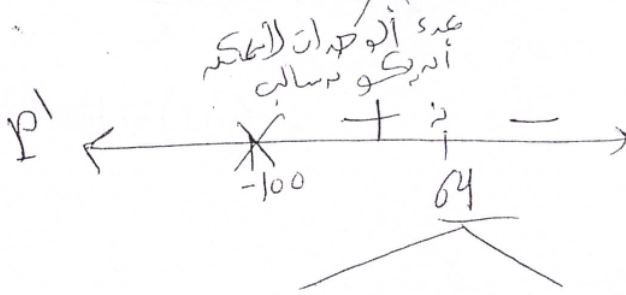
$$= 6400 - 36X - X^2 = 0$$

$$a = -1, b = -36, c = 6400$$

$$\therefore X = \frac{36 \pm \sqrt{(-36)^2 - 4(-1)(6400)}}{2(-1)}$$

$$= \frac{36 \pm 164}{-2} \Rightarrow \begin{cases} -100 \\ 64 \end{cases}$$

$$\therefore X = -100, 64$$



$$\therefore \# \text{ of units} = 64$$

$$\text{max. profit} = P(64)$$

$$= 6400(64) - 18(64)^2 - \frac{1}{3}(64)^3 - 40000$$

$$= 208490.6$$