

Answer to Question #87538 – Math – Algebra

Question

The profit made by a company when 60 units of its product is sold is \$1600. When 150 units of its products are sold, the profit increases to \$5200. Assuming that the profit function is linear and of the form.

Solution

Let profit function be linear as follows:

$$P(u) = a + bu$$

$$\text{When } u = 60, P = 1600$$

$$1600 = a + 60b \dots(i)$$

$$\text{When } u = 150, P = 5200$$

$$5200 = a + 150b \dots(ii)$$

Subtracting (i) from (ii),

$$5200 = a + 150b$$

$$1600 = a + 60b$$

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$$3600 = 90b$$

$$b = \frac{3600}{90}$$

$$b = 40.$$

Put this value in (i),

$$1600 = a + 60(40)$$

$$1600 = a + 2400$$

$$a = -800.$$

So, Profit function : $P(u) = 40u - 800$.