

[5] The demand for x units of a product is given by $p = 60 - .5x$, if no more than 75 units can be sold, find the number of units that must be sold in order that the sales revenue be \$1000.

1000\$ = ^{revenue} $R(x)$ مورد آسان

$$\begin{aligned} R(x) &= p x \\ &= (60 - .5x) x \\ &= 60x - .5x^2 \end{aligned}$$

$$\rightarrow R(x) = 1000$$

$$60x - .5x^2 = 1000$$

$$60x - .5x^2 - 1000 = 0$$

$$a = -.5, \quad b = 60, \quad c = -1000$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-60 \pm \sqrt{60^2 - 4(-.5)(-1000)}}{2(-.5)}$$

$$= \frac{-60 \pm 40}{-1}, \quad \frac{-60 - 40}{-1}$$

$$= 20, \quad 100$$

~~1000\$ = R(x) = 60x - .5x^2~~
~~1000 = 60x - .5x^2~~
~~1000 - 60x = -.5x^2~~
~~2000 - 120x = -x^2~~
~~x^2 - 120x + 2000 = 0~~
~~a = 1, b = -120, c = 2000~~
~~x = \frac{-(-120) \pm \sqrt{(-120)^2 - 4(1)(2000)}}{2(1)}~~
~~= \frac{120 \pm \sqrt{14400 - 8000}}{2}~~
~~= \frac{120 \pm \sqrt{6400}}{2}~~
~~= \frac{120 \pm 80}{2}~~
~~= \frac{120 + 80}{2}, \frac{120 - 80}{2}~~
~~= 100, 20~~
~~∴ 20 or 100 units must be sold to get a sales revenue of \$1000.~~