Problem Definition

Problem 77. **Marginal Analysis** Find the change in Cost, C. Revenue, R, or Profit, P. In each case, that the number of units, x, increases by three from the specified value of x.

$$\frac{dR}{dx} = 48 - 3x, \qquad x = 12$$

Solution Step 1:

In this case, the marginal analysis is applied to the revenue function. The first step is to compute the revenue function from the marginal revenue. Since we want the change from $x = 12$ to $x = 15$, we need to compute the definite integral

$$\text{Change in Revenue } = \int_{12}^{15} \frac{dR}{dx} dx = int_{12}^{15}(48 - 3x)dx$$

Solution Step 1:

The value is given by

$$\begin{aligned} int_{12}^{15}(48 - 3x)dx &= (48x - \frac{3}{2}x^2)|_{12}^{15} \\ &= (48(15) - \frac{3}{2}(15)^2) - (48(12) - \frac{3}{2}(12)^2) \\ &= 382.50 - 360.00 \\ &= 22.50 \end{aligned}$$

So, the change in revenue is \$22.50.