Total Cost = $C(x)$

Marginal Cost = $C\,'(x)$ Approximates the cost of producing one more item at the production level of x items.

$C(x+1) - C(x)$ = Exact Cost of producing the $x+1$ st item.

$C\,'(x)$ approximates $C(x+1) - C(x)$ (See Example 1 on page 270)

Total Sales = $S(t)$ This is a function of time t.

For example, you might have your total sales figured by the month.

$S\,'(t)$ represents the rate at which sales are increasing (or decreasing).

In general terms, Revenue = (Price)(Quantity)

Each part of this can be a function of either demand (number manufactured) or time.

Total Revenue = $R(x)$ with x representing demand or production level.

Marginal Revenue = $R\,'(x)$

This tells what level revenue is increasing (or decreasing) at certain production levels.

In Example 4 on page 303, Monthly Revenue = $R(t)$ Here you are figuring Revenue as a function of time t in months. This of course could be done in any other time increments.

Marginal Revenue = $R\,'(t)$

This tells at what rate revenue is increasing (or decreasing) at a certain time.

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

Marginal Profit = $P\,'(x) = R\,'(x) - C\,'(x)$

This tells what level profit is increasing (or decreasing) at certain production levels.

Break-even points: Where $C(x) = R(x)$.

(Cost is equal to revenue. Money is not being gained or lost.)

Average Cost = $\overline{C}(x) = \dfrac{C(x)}{x}$ (Cost per unit)

Marginal Average Cost $= \overline{C}\,'(x)$ (See Example 4 on page 275.)

Average Revenue $= \overline{R}(x) = \dfrac{R(x)}{x}$ (Revenue per unit)

Marginal Average Revenue$= \overline{R}\,'(x)$

Average Profit $= \overline{P}(x) = \dfrac{P(x)}{x}$ (Profit per unit)

Marginal Average Profit $= \overline{P}\,'(x)$

CAUTION: You must find the "Average" function FIRST, then take the derivative to get "Marginal Average".
So, for example, $\overline{P}\,'(x)$ does NOT equal $\dfrac{P\,'(x)}{x}$.

CREATING A REVENUE FUNCTION:

In a $price - demand$ equation, x will represent the demand (# of units) for a particular price p. This is usually given as an equation with $x =$ followed by an expression in terms of the variable p.
From this the equation can be solved for $p =$ in terms of x (Price in terms of demand x)

Revenue $R(x) = xp$ (Revenue = # units times the price.)