

Given Marginal Revenue function,  $MR = 100 - 2q$ , find

- a. The total revenue function
- b. The demand function

**Solution.**

The marginal revenue function is the first derivative of the total revenue function:

$$MR = (TR)'$$

Then

$$TR = \int MR \, dq = \int (100 - 2q) \, dq = 100q - q^2$$

Total revenue equals price (inverse demand function),  $P$ , times quantity,  $q$ , or

$$TR = P \times q$$

So

$$P = \frac{TR}{q} = \frac{100q - q^2}{q} = 100 - q$$

The inverse demand function  $P = f^{-1}(q)$ . So

$$P = 100 - q$$

Then

$$q = 100 - P$$

**Answer:**

$$TR = 100q - q^2$$

$$q = 100 - P$$