

1.2 - Business Applications

I. Break-Even Analysis

Cost function - $C(x) = (\text{variable cost}) + (\text{fixed cost})$

Revenue function - $R(x) = \text{total revenue or income} = \text{price} * \text{quantity}$

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

Break-Even - when revenue equals cost

Example: A company produces digital cameras. The price function is given by $p(x) = -5x + 94.8$ where x and p are both in thousands. The fixed costs are \$156 and variable costs are \$19.7 where x is given in thousands.

(a) Find cost and revenue functions. Sketch them in the same coordinate system. Label areas of profit and loss.

(b) Find the break-even points and production for maximum revenue.

(c) Find the profit function.

II. Market Equilibrium

Demand equation - expresses the demand q (number of items demanded) as a function of price p

Supply equation - expresses the supply q (number of items a supplier is willing to make available) as a function of price p

Note: It is usually the case that demand decreases and supply increase as price increases.

Market-equilibrium - when demand equals supply