

Price-related Math

Break-even point

Definition

The point at which sales revenue equals the costs and expenses of making and distributing a product; after this point is reached, businesses begin to make a profit on the product

Calculation

(number of units x cost to produce each unit) ÷ sales price = break-even point

Example

A toy manufacturer plans to make 100,000 dolls that will be sold at \$6 each to retailers. The cost of making and marketing the dolls is \$4.50 per unit. Determine the break-even point:

$$100,000 \times \$4.50 = \$450,000$$

$$\$450,000 \div 6 = 75,000$$

The manufacturer must sell 75,000 units to break even. To make a profit, the firm must sell more than 75,000 units.

Market share

Definition

A firm's percentage of the total sales volume generated by all competitors in a given market

Calculation

firm's total sales in a given market ÷ amount of sales in a given market = market share in dollars

Example

The hard disk music player (a.k.a. mp3 player) market is a \$26.2 billion a year industry. Apple's iPod owns 87% of the hard disk music player market. Microsoft's Zune now owns 8.7%. The Archos 605 wi-fi holds 1.2% and all other players own the remaining 3.1%. What is the amount in dollars of the iPod's total share of the market? The Zunes' market share? The amount for the others?

iPod: $26.2 \times .87 = 22.794$ or \$22,794,000,000 (because the first number is a decimal expressed in billions, everything to the left of the decimal is in billions)

Zune: $26.2 \times .087 = 2.2794$ or \$2,279,400,000

Archos: $26.2 \times .012 = 0.3144$ or \$3,144,000 (because a zero appears to the left of the decimal, the number is expressed in terms of the next denomination down, or millions)

Others: $26.2 \times .031 = 0.8122$ or \$8,122,000

Sales revenue

Definition

Amount a company earns by selling a certain number of items at a sales price; does not factor in costs to produce those items

Calculation

price x number of units sold = sales revenue

Example

A company sold 200,000 graphing calculators in 2007 for \$78 each. Each one costs \$50 to manufacture and market. What is the company's sales revenue?

$200,000 \times \$78 = \$1.56 \text{ million (or } \$1,560,000)$

Profit

Definition

The amount a firm makes on a product after expenses associated with its manufacturing and marketing are factored in; also known as return

Calculation (per unit)

amount charged for one unit – manufacturing and marketing expenses per unit = profit

Calculation (for a product category)

sales revenue for a type of product – manufacturing and marketing expenses for that product = profit

Example (from above)

A company sold 200,000 graphing calculators in 2007 for \$78 each. Each one costs \$50 to manufacture and market. What is the company's per unit and overall profit for the graphing calculators?

Per unit: $\$78 - \$50 = \$18$ profit per unit

Per product category: $200,000 \times \$50 = \1 million in manufacturing and marketing costs
 $\$1.56 \text{ million (sales revenue calculated above)} - \$1 \text{ million} = \$560,000$ profit per product category

Return on Investment

Definition

Calculation used to determine the relative profitability of a product

Calculation

profit ÷ investment

Example (from above)

A company sold 200,000 graphing calculators in 2007 for \$78 each. Each one costs \$50 to manufacture and market. What is the company's return on investment for the graphing calculators?

$\$18$ (profit per unit determined above) ÷ $\$50 = .36$ or 36% return on investment