Solving Equations and Inequalities

2.5

Markup and Discount Problems

Objectives

1 Markup problems

2 Discount problems

Markup problems

Markup problems

Cost is the price that a business pays for a product. **Selling price** is the price for which a business sells a product to a customer.

The difference between selling price and cost is called **markup**. Markup is added to a retailer's cost to cover the expenses of operating a business and to make a profit.

Markup is usually expressed as a percent of the retailer's cost. This percent is called the **markup rate.**

The basic markup equations used by a business are

Selling price = Cost + Markup

$$S = C + M$$

Markup = Markup rate $\cdot$ Cost

$$M = r \cdot C$$

Markup problems

By substituting $r \cdot C$ for M in the first equation, we can also write selling price as

$$S = C + M$$
$$S = C + (r \cdot C)$$
$$S = C + rC$$

The equation $S = C + rC$ is the equation used to solve the markup problems.

Example 1

The manager of a clothing store buys a suit for $180 and sells the suit for $252. Find the markup rate.

Strategy:

Given: C = $180

S = $252

Unknown markup rate: r

Use the equation $S = C + rC$.

Example 1 – *Solution*

$S = C + rC$

$252 = 180 + 180r$ Substitute the values of *C* and *S* into the equation.

$252 - 180 = 180 - 180 + 180r$ Subtract 180 from each side of the equation.

$72 = 180r$

$$\frac{72}{180} = \frac{180r}{180}$$ Divide each side of the equation by 180.

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Example 1 – *Solution*

cont'd

$0.4 = r$

The decimal must be changed to a percent.

The markup rate is 40%.

Discount problems

Discount problems

Discount is the amount by which a retailer reduces the regular price of a product for a promotional sale. Discount is usually expressed as a percent of the regular price. This percent is called the **discount rate** or **markdown rate.**

The basic discount equations used by a business are

Sale price = Regular price – Discount

$$S \quad = \quad R \quad - \quad D$$

Discount = Discount rate · Regular price

$$D \quad = \quad r \quad \cdot \quad R$$

Discount problems

By substituting $r \cdot R$ for D in the first equation, we can also write sale price as

$$S = R - D$$

$$S = R - (r \cdot R)$$

$$S = R - rR$$

The equation $S = R - rR$ is the equation used to solve the discount problems.

Example 3

In a garden supply store, the regular price of a 100-foot garden hose is $48. During an "after-summer sale," the hose is being sold for $36. Find the discount rate.

Strategy:

Given: R = $48

S = $36

Unknown discount rate: r

Use the equation $S = R - rR$.

Example 3 – *Solution*

$S = R - rR$

$36 = 48 - 48r$ Substitute the values of R and S into the equation.

$36 - 48 = 48 - 48 - 48r$ Subtract 48 from each side of the equation.

$-12 = -48r$

$$\frac{-12}{-48} = \frac{-48r}{-48}$$ Divide each side of the equation by -48.

Example 3 – *Solution*

cont'd

$0.25 = r$

The decimal must be changed to a percent.

The discount rate is 25%.