DECREASING AND INCREASING BY A PERCENTAGE

Common words used to represent a **decrease** in price include: reduction, discount, sale, loss or depreciation.

In that case, the new value equals the original value minus the decrease.

Selling price = retail price - discount

Common words used to represent an **increase** in price include markup and profit.

In that case, the new value equals the original value plus the increase.

Selling price = wholesale price + markup

DECREASING AND INCREASING BY A PERCENTAGE

Increasing or decreasing by a set percentage involves finding a percentage of the quantity.

Example 1: How much is a 15% markup on $200?

$$\text{Markup} = 0.15 \times 200 = \$30$$

Therefore the price after 15% markup is 200 + 30 = **$230**

Example 2: How much is a 20% discount on a $300 coat?

$$\text{Discount} = 0.20 \times 300 = \$60$$

Therefore the price after 20% discount is 300 - 60 = **$240**

Find the new value when:

a \$160 is increased by 40%

b \$63 is decreased by 20%

SOLUTION

a 40% of $\$160 = \frac{40}{100} \times \frac{160}{1} = \$64$

New price $= \$160 + \$64$
$= \$224$

Alternative method:

$100\% + 40\% = 140\% = 1.4$

$\$160 \times 1.4 = \$224$

b 20% of $\$63 = \frac{20}{100} \times \frac{63}{1} = \$12.60$

New price $= \$63 - \$12.60$
$= \$50.40$

Alternative method:

$100\% - 20\% = 80\% = 0.8$

$\$63 \times 0.8 = \$50.40$

EXPLANATION

Calculate 40% of \$160.

Cancel and simplify.

New price = original price + increase

The new value is 140% of the old value.

Calculate 20% of \$63.

Cancel and simplify.

New price = original price − decrease

a Find the cost of a \$860 television that has been discounted by 25%.

b Find the cost of a \$250 microwave oven that has been marked up by 12%.

SOLUTION

a Discount = 25% of \$860

$$= \frac{25}{100} \times \frac{860}{1} = \$215$$

Selling price = \$860 − \$215

= \$645

Alternative method:

100% − 25% = 75% = 0.75

\$860 × 0.75 = \$645

b Mark-up = 12% of \$250

$$= \frac{12}{100} \times \frac{250}{1} = \$30$$

Selling price = \$250 + \$30

= \$280

Alternative method:

100% + 12% = 112% = 1.12

\$250 × 1.12 = \$280

EXPLANATION

Calculate 25% discount.

Cancel and simplify.

Selling price = cost price − discount

Calculate 12% of \$250.

Cancel and simplify.

Selling price = cost price + mark-up