Percentage Increase and Decrease

Note Title 28/09/2009

Finding the percentage

$$\text{Percentage increase} = \frac{\text{Actual increase}}{\text{Original amount}} \times 100$$

(or we could replace 'increase' by 'decrease')

Examples

① The price of a coat has increased from €60 to €65. What is the percentage increase?

$$\frac{5}{60} \times 100 = 8.\dot{3}\%$$

② A piece of wood 3 metres long shrinks by 1cm when it dries out. What is the percentage decrease in length?

units must match →

$$\frac{1\text{ cm}}{300\text{ cm}} \times 100 = 0.\dot{3}\%$$

Finding the Amount

The ORIGINAL amount is always 100%

Examples

① A CD player is reduced by 15% in a sale. The sale price is £42.50. What was the original price?

	Amount	%age
Original	x	100 %
New	42.50	85%

$$\frac{x}{42.50} = \frac{100}{85}$$

$(\times 42.50)$ $(\times 42.50)$

$$x = 42.50 \times \frac{100}{85}$$

$$= £50$$

② A computer is advertised as costing "£380 + VAT". What will the full price be if VAT is 15%.

	Amount	%age
Original	380	100
New	x	115

$$\frac{x}{380} = \frac{115}{100}$$

(always have 'x' on the top)

$$x = 380 \times \frac{115}{100}$$

$$= £437$$

Compound Percentages

Example A building society savings account adds 3% interest each year. Anna has £400 in her account. If she doesn't pay any more money in, how much will she have in:

(a) 1 year
(b) 2 years
(c) 3 years
(d) 10 years

(a)

	Amount	%age
Orginal	400	100
New	x	103

$$\frac{x}{400} = \frac{103}{100}$$

$$x = 400 \times \frac{103}{100}$$

$$= £412$$

(b) $412 \times \frac{103}{100} = €424.36$

(c) $424.36 \times \frac{103}{100} = €437.09$

(d) $400 \times \underbrace{\frac{103}{100} \times \frac{103}{100} \times \frac{103}{100} \times \cdots\cdots \times \frac{103}{100}}_{10 \text{ years}}$

$= 400 \times \left(\frac{103}{100}\right)^{10}$

$= €537.57$