Percentages – summary

Percentage of a quantity

% means "*out of* 100" *or* $\frac{\cdots}{100}$ *or* $\div 100$

e.g. 27% *of* 152 *is* $27 \div 100 \times 152 = 41.04$

One number as a % of another

Work out the fraction of the quantity as a decimal then multiply by 100 to transform into a %

e.g. Express 41.04 as a percentage of 152:

$\frac{41.04}{152} = 41.04 \div 152 = 0.27$ *and* $0.27 \times 100 = 27\%$

Express an increase/ decrease as a percentage

Work out the amount the quantity has increased/decreased by express this amount as a percentage of the origin amount

e.g.

- A price went from £152 to £110.96. What is the % decrease?

  $152 - 110.96 = 41.04$ decrease (out of 152)

  $41.04 \div$ (out of) $152 = 0.27$ and $0.27 \times 100 = 27\%$ decrease.

- A price went from £110.96 to £152. What is the % increase?

  $152 - 110.96 = 41.04$ increase (out of 110.96)

  $41.04 \div$ (out of) $110.96 = 0.3699$ and $0.3699 \times 100 = 36.99\%$ increase

Increasing/decreasing using a multiplier

To increase an amount by 27%, multiply by 1.27 (you effectively work out 127% of the original quantity) To decrease an amount by 27%, multiply by 0.73 (you work out what is left: 73% of the original quantity)

e.g.

- Increase 152 by 27% : $152 \times 1.27 = 193.04$
- Decrease 152 by 27% : $152 \times 0.73 = 110.96$

Note: Increase or decrease, you MULTIPLY the amount by the multiplier.

Working out the original amount after a percentage change

To work out the original amount, DIVIDE the new amount by the multiplier: DIVIDE by 1. .... to retrieve an original amount after an increase DIVIDE by 0. .... to retrieve an original amount after a decrease

e.g.

- After an increase of 27%, an amount has reached £193.04.
  What was the original price? £193.04 ÷ 1.27 = £152
- After a decrease of 27%, an amount has reached £110.96
  What was the original price? £110.96 ÷ 0.73 = £152

Note: Increase or decrease, you DIVIDE the amount by the multiplier.

Repeated % changes. Compound interests

C : the capital (the original amount put in the bank) $ab\%$: the (compound) interest *per annum* (*per year*) n : the number of years the money stay in the bank After, n years, the amount in the bank is : $C \times (1.ab)^n$

e.g. I have £152 in a saving account with interest 27% per annum.
How much money will I have in 7 years?

$£152 \times (1.27)^7 = £809.97$