Numeracy

1. Fractions
2. Percentages
3. Bar Chart
4. LineGraph
5. Scatter graph
6. PieChart
7. Ratio
8. Proportion
9. Time
10. Measurement
11. Re-arrangingformula

H HONESTY
E EQUALITY
A AMBITION
R RESPONSIBILITY
D DETERMINATION

Fractions

When finding a fraction of a quantity the rule is "divide by the bottom, multiply by the top".

Examples

1. $^1/_3$ of £360

= 360 ÷ 3 x 1

= £120

2. Class 1A has 28 pupils.

$^4/_7$ of them are boys.

How many boys are in 1A?

=28 ÷ 7 x 4
= 16 boys

Menu

Percentages

Finding a percentage of a quantity with a calculator

To find a percentage, divide the percentage by 100 and multiply by the quantity in the question.

Examples

1. Find 38% of £48

$38 \div 100 \times 48$

$= £18 \cdot 24$

2. A car loses 15% of it's value in one year. If it was worth £7000 last year, how much is it worth now?

$15 \div 100 \times £7000$

$= £1050$

$£7000 - £1050$

$= £5950$

Menu

Percentages

Finding a percentage of a quantity without a calculator

It is important to know how to find some key percentages as they can help you to solve problems without a calculator.

50% - divide by 2

25% - divide by 4

75% - divide by 4 then multiply by 3

10% - divide by 10

5% - divide by 10 then divide by 2

1% - divide by 100

Example

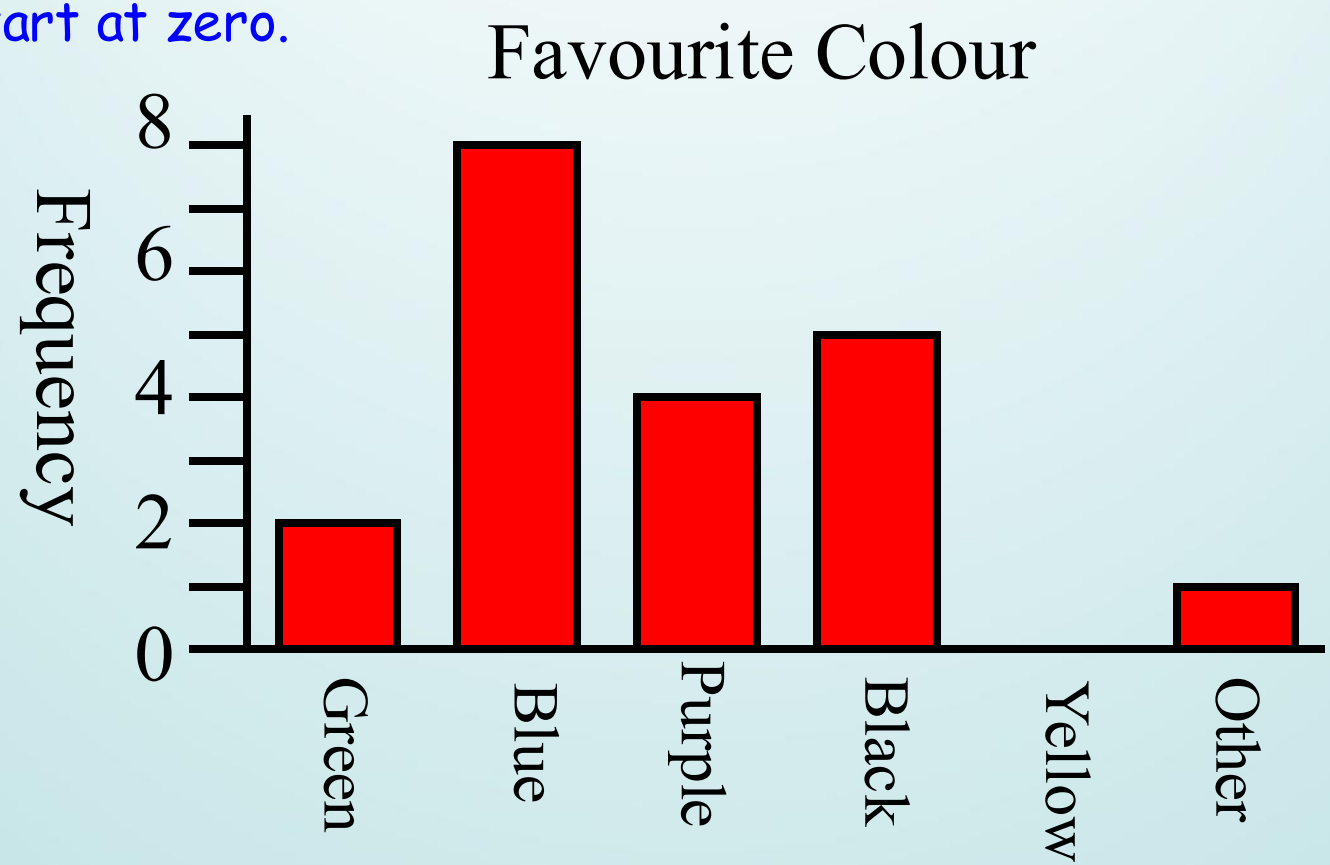
Find 15% of 560.

10%= 560 ÷ 10 = 56
5% = 56 ÷ 2 = 28
15% = 56 + 28 = 84

Menu

Bar Charts

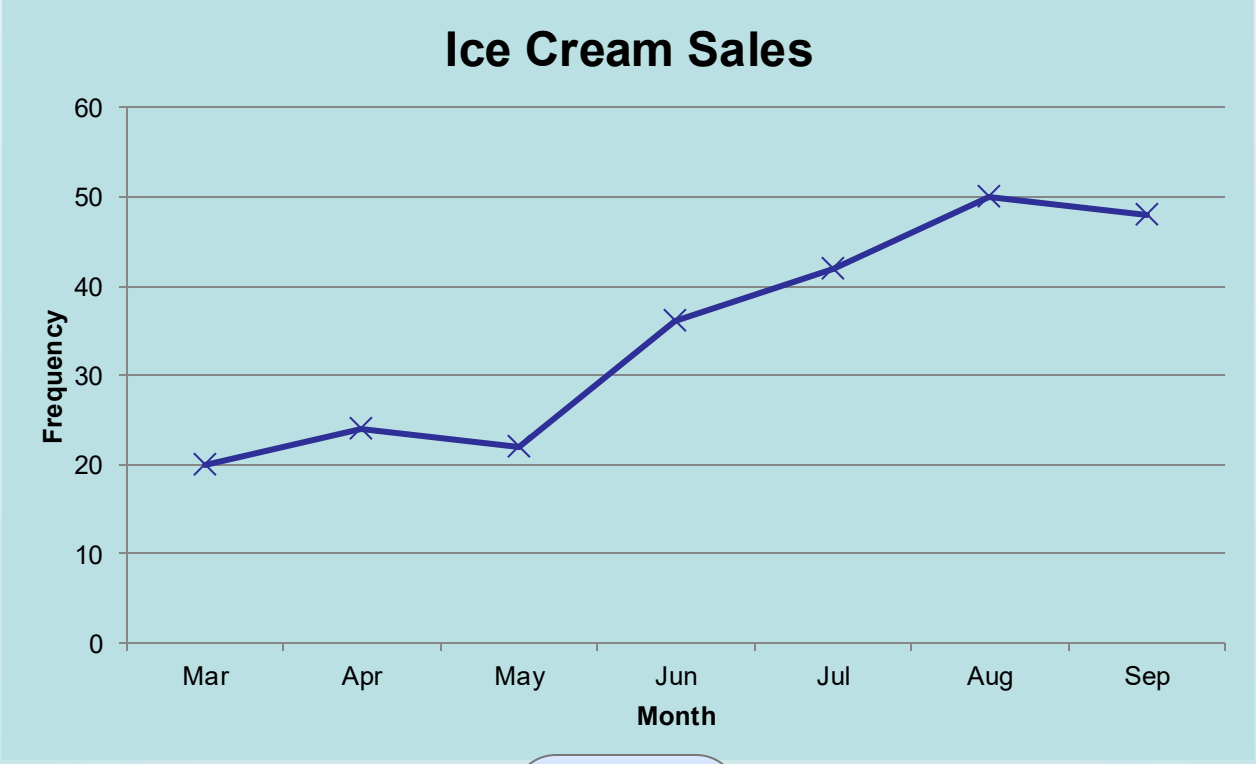
Bar charts should have a title, even scale and labelled axes. Bars should be equal widths and have a even gap between each one. The vertical axis should start at zero.



Menu

Line Graphs

Line Graphs are often used to show how things change with time. They make trends easy to see. Line graphs should have a title, even scale and labelled axes. Points should be marked with a small cross or dot and joined with straight lines.

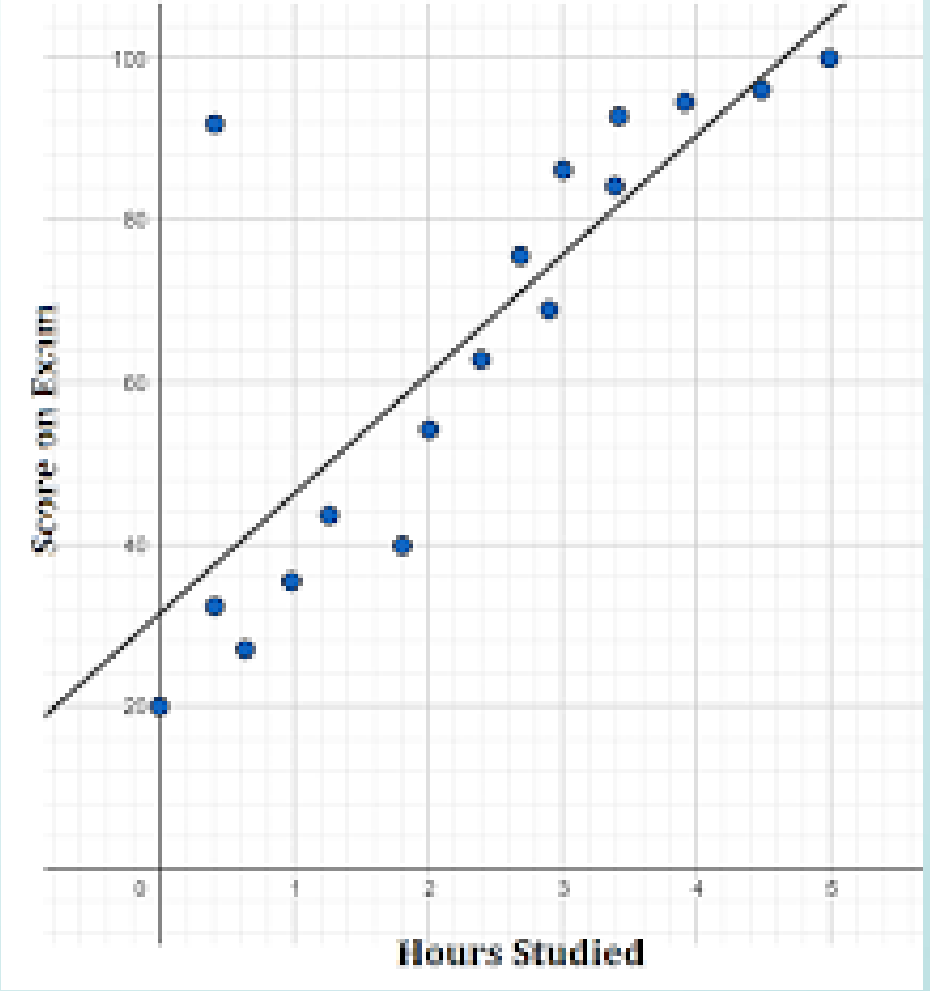


Menu

Scatter Graphs

A scatter graph is normally compares 2 sets of data. They make it easy to see if there is a connection between the data sets e.g. is there a positive or negative correlation? If there is we can draw a line of best fit (A line through the middle of the points as shown).

Scatter graphs need to have an appropriate scale and axes labelled. Points should be marked with a small cross or dot.



Pie Charts

Reading information from a Pie Chart (with divisions)

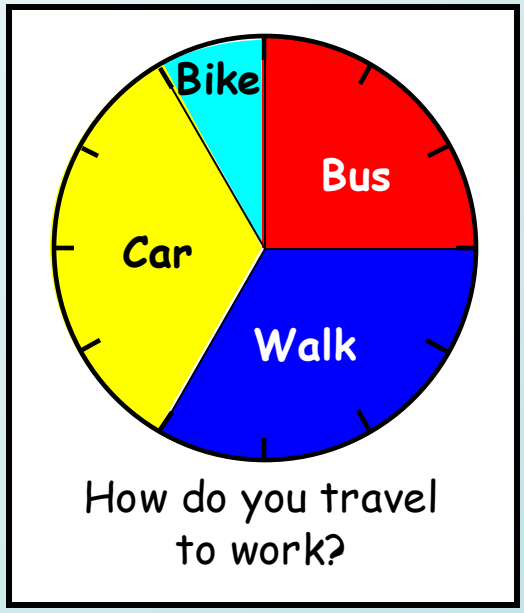
Pie charts are used to display a range of information, for example the results from a survey.

Example

Sixty people were asked how they travel to work. The pie chart on the right was produced.

Since there are twelve divisions on the pie chart then each division must be worth five (60 ÷ 12 = 5) people.

So 15 people caught the bus, 20 walked, 20 drove and 5 cycled.

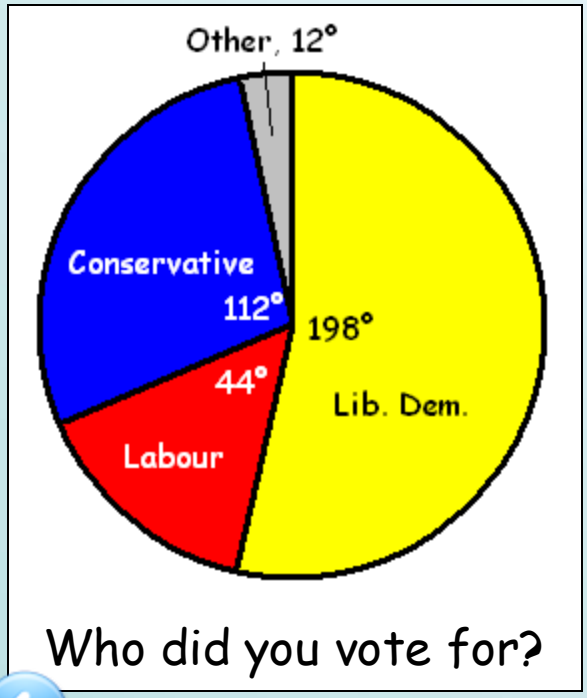


Menu

Pie Charts

Reading information from a Pie Chart (with angles)

If angles are marked in the centre of a pie chart, you can use them to interpret the pie chart. Remember the angles will add up to 360° in total, so each angle represents a fraction of 360°.



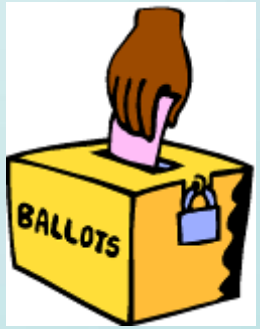
Example

90 people were asked who they voted for in a general election. The pie chart on the right was produced.

How many people voted for Conservative?

$$\frac{112}{360} \times 90$$

$$= 28 \text{ people}$$



Menu

Ratio

Ratios can be used to compare different quantities.

Example

The ingredients for humous are as follows:

2 garlic cloves, 200 grams of chick peas, 150 grams of olives, 5 ml of Tahina paste and 4 tablespoons of olive oil.

Write the ratio of chick peas to oil.

chick peas : olives

200 : 150

4 : 3

Menu

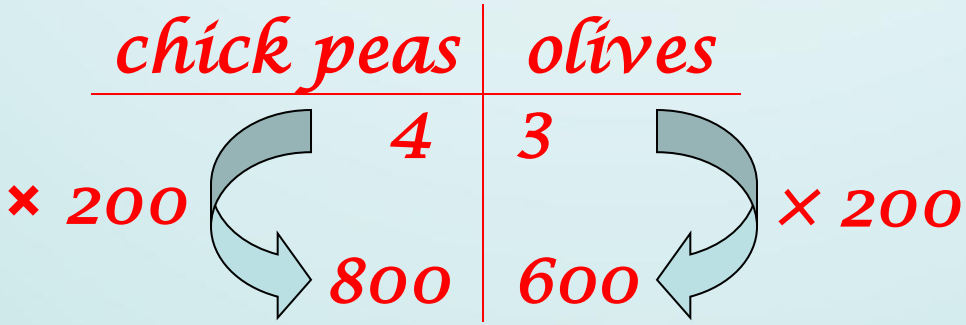
Ratio

Ratios can be used to compare different quantities.

Example (continued)

A chef makes more humous than normal.

If he uses 800 grams of chickpeas how many grams of olives will he need?



The chef will need 600 grams of olives.

Menu

Direct Proportion

Two related quantities are in direct proportion if an increase in one causes an increase in the other.

Example

Three Mars Bars cost £1·53. Calculate the cost of 5.

Mars Bars		Cost	
	3	£1·53	
÷ 3			÷ 3
	1	£0·51	
× 5			× 5
	5	£2·55	

Five Mars Bars will cost £2·55

Menu

Indirect Proportion

Two related quantities are in inverse proportion if an increase in one causes a decrease in the other.

Example

It takes two painters six days to completely paint a house. How long would it take if they employ an extra painter?

Painters	Days
2	6
÷ 2	× 2
1	12
× 3	÷ 3
3	4

It will take three painters four days to paint the house.

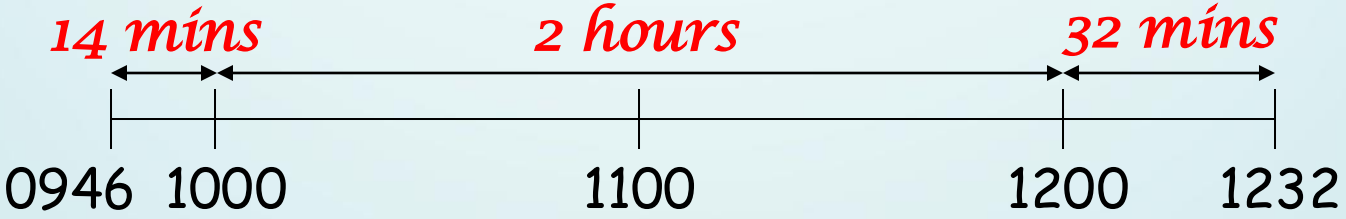
Menu

Time Intervals

Time intervals are easier to find if you draw a line to help.

Example

Find the time difference between 0946 hrs and 1232 hrs.



Total Time = 2 hours + 14 mins + 32 mins
= 2 hours and 46 mins

Menu

Time- Hours and Minutes

Decimal time needs to be used in calculations. Final answers are stated in hours and minutes.

Examples

Change 4·1 hours into hours and minutes.

0·1 hours = 0·1 × 60 = 6 minutes.

4·1 hours = 4 hours and 6 minutes.

Change $5^1/_3$ hours into hours and minutes.

$^1/_3$ of an hour = $^1/_3$ of 60 = 20 minutes.

$5^1/_3$ hours = 5 hours 20 minutes.

Change 7 hours 24 minutes into hours (decimal form).

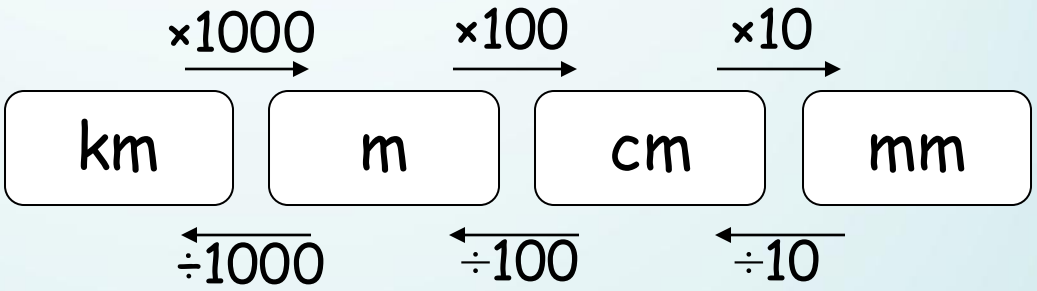
24 minutes = 24 ÷ 60 = 0·4 hours

7 hours 24 minutes = 7·4 hours.

Menu

Metric Conversions- Length

1 cm = 10 mm
1 m = 100 cm
1 km = 1000 m



Examples

Convert 3·2 km to metres.

3·2 × 1000 = 3200 m

Convert 2500 mm to cm.

2500 ÷ 10 = 250 cm

Convert 3500 mm to m.

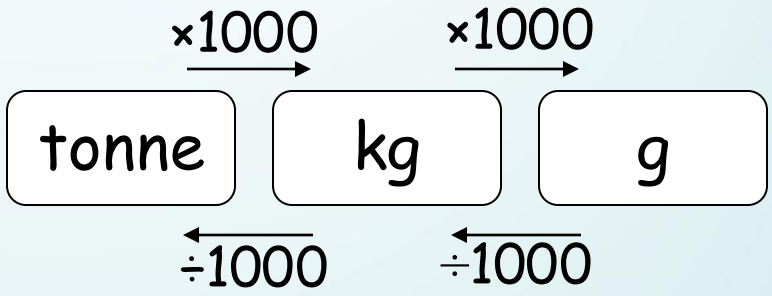
3500 ÷ 1000 = 3.5 m

(1000 = 10 x 100)

Menu

Metric Conversions- Mass

1 kg = 1000 g
1 tonne = 1000 kg



Examples

Convert 9·3 kg to grammes.

9·3 × 1000 = 9300 g

Convert 6120 g to kilogrammes.

6120 ÷ 1000 = 6·12 kg

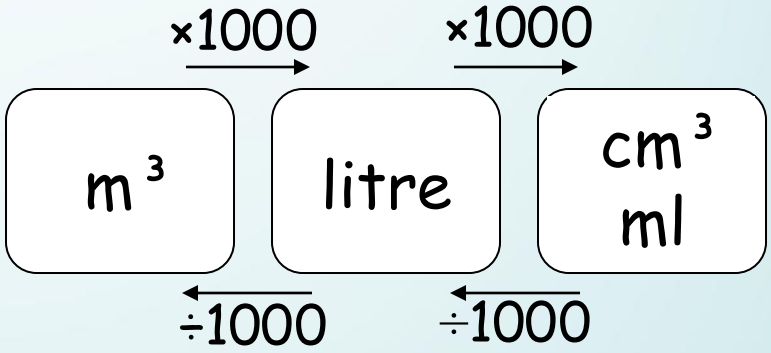
Menu

Metric Conversions- Volume

$1\ cm^3 = 1\ ml$

$1000\ cm^3 = 1000\ ml = 1\ litre$

$1000\ litres = 1\ m^3$



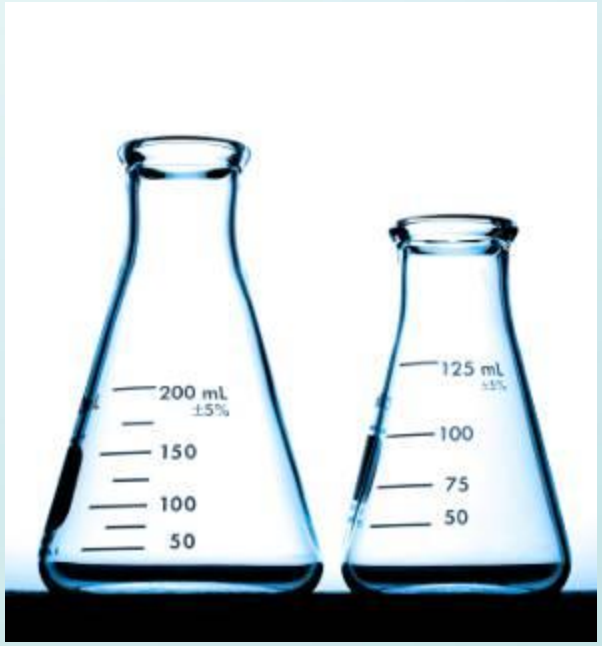
Examples

Convert $1{\cdot}7\ m^3$ to litres

$1{\cdot}7 \times 1000 = 1700\ \ell$

Convert $3245\ cm^3$ to litres.

$3245 \div 1000 = 3{\cdot}245\ \ell$



Menu

Re-arranging Formulae

This means we want to rewrite a formula so that the variable we want to calculate become the subject on the left of the equal sign.

Given $b = 5a + 21$, if I wanted to calculate a, I need to rearrange the formula.

$b = 5a + 21$

$-21 \quad -21$

$b - 21 = 5a$

$\div 5 \quad \div 5$

$\frac{b - 21}{5} = a$

Therefore $a = \frac{b - 21}{5}$

Rearrange by doing the same 'Inverse' steps as you would to solve an equation

$a = \frac{v - u}{t}$

Rearrange for v

$a \times t = \frac{v - u}{t} \times t$

$at = v - u$

$+ u \quad +u$

$at + u = v$

$v = u = at$

Menu