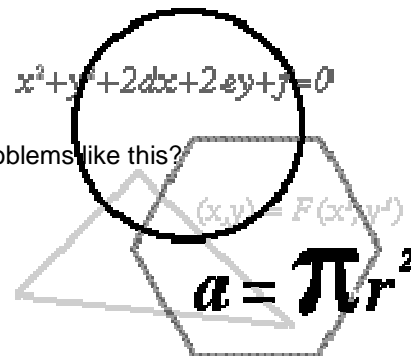


# Mathematics

## PROBLEM SOLVING GUIDE

- See
- read and understand the question/ problem/ task
  - re-read the task
  - decode the information. What is important?
  - clarify the problem/ ask questions
- Plan
- develop strategies to use
  - develop a plan of attack
  - brainstorm
  - look for a pattern (have I done other problems like this?)
- Do
- carry out the plan
  - do calculations
  - get a solution
- Check
- review and revise procedures
  - have I answered the question?
  - is my solution reasonable? Does it make sense?
  - interpret the solution in the context of the problem
- Present
- communicate what you have done/ found out in an appropriate form.  
For example, written, oral, using ICT's/ multimedia.
  - Have you used the correct text type?



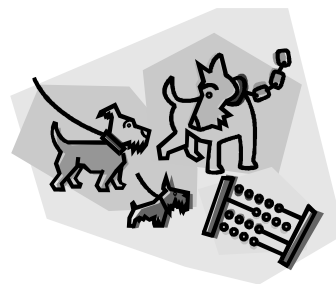
## SOME BASICS – A QUICK GUIDE

*Perimeter* is the sum of all side lengths.

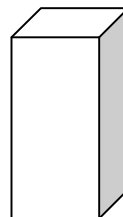
*Circumference* of a circle =  $\pi$  x Diameter, where  $\pi \approx 3.14$ .

*Basic area rules*

$$\begin{aligned} \text{Rectangle} &= L \times W \\ \text{Triangle} &= \frac{B \times H}{2} \\ \text{Circle} &= \pi \times r^2 \end{aligned}$$

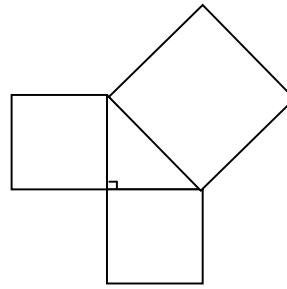


*Volume of a prism* = Area of base x Height

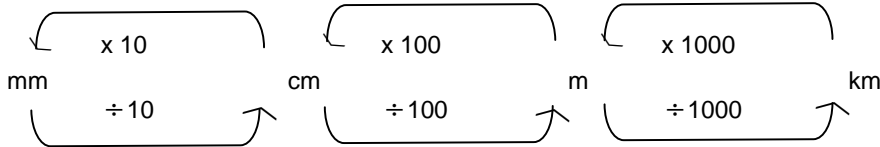


*Pythagoras' Theorem*

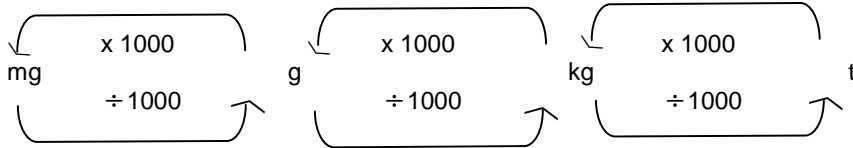
$$c^2 = a^2 + b^2$$



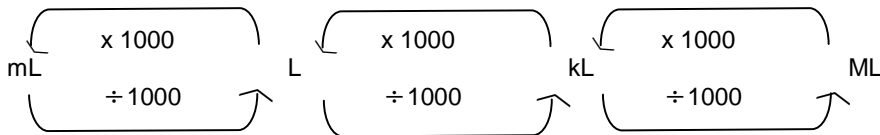
*Length converter*



*Mass converter*



*Capacity converter*



Some useful definitions

*Quotient* - the result you get when you divide one number by another.  
eg.  $12 \div 6 = 2$ . The quotient is 2.

*Product* - the result you get when you multiply two or more numbers together.  
Eg.  $3 \times 7 = 21$ . The product of 3 and 7 is 21.

*Sum* - the result you get when you add two or more numbers together.  
Eg.  $4 + 7 + 2 = 13$ . The sum of 4, 7 and 2 is 13.

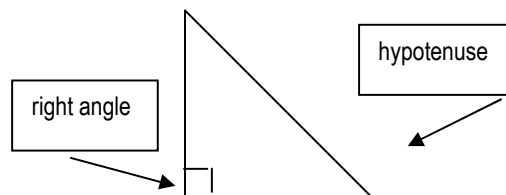
*Difference* - the result you get when you take one number away from another number.  
Eg.  $8 - 3 = 5$ . The difference of 8 and 3 is 5.

*Denominator* - the part of the fraction below the fraction line.

*Numerator* - the part of the fraction above the fraction line.

Eg.  $\frac{3}{4}$ , the numerator is 3 and the denominator is 4.

*Hypotenuse* - the side opposite the right angle in a right angled triangle.



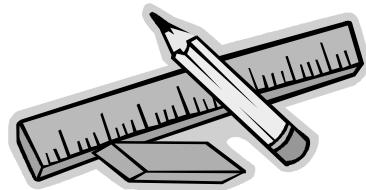
MULTIPLICATION TABLE															
X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225

**SI INTERNATIONAL SYSTEM OF MEASUREMENTS**

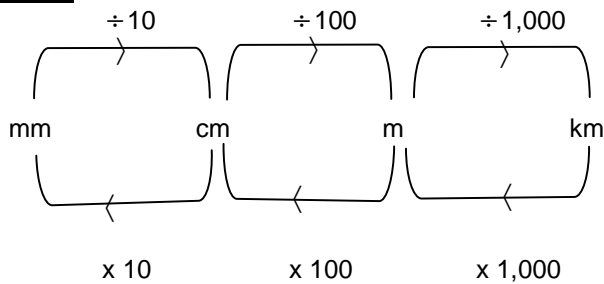
**LENGTH**

Base unit is metre (m)

- 1,000 millimetre (mm) = 1 metre
- 100 centimetre (cm) = 1 metre
- 1,000 metres (m) = 1 kilometre (km)



**Conversion :**



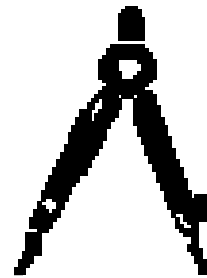
**Area :**

Base unit is square metre (m<sup>2</sup>)

- 100 square millimetres (mm<sup>2</sup>) = 1 square centimetre (cm<sup>2</sup>)
- 10,000 square centimetres (cm<sup>2</sup>) = 1 square metre (m<sup>2</sup>)

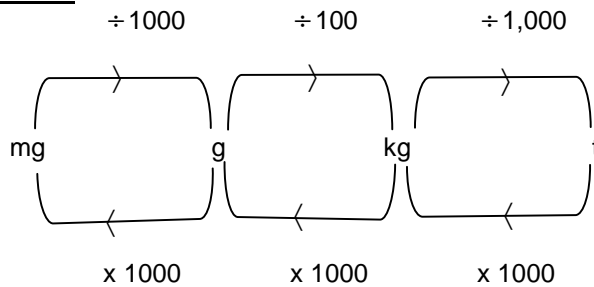
1,000,000 square metres (m<sup>2</sup>) = 1 square kilometre (km<sup>2</sup>)  
 10,000 square metres (m<sup>2</sup>) = 1 hectare (ha)

**Volume :** Base unit is cubic metre (m<sup>3</sup>)  
 1 cubic centimetre (cm<sup>3</sup>) = 1 millilitre (mL)  
 1000 cubic centimetres (cm<sup>3</sup>) = 1 litre (L)  
 1 cubic metre (m<sup>3</sup>) = 1000 litres (L)



**Mass :** Base unit is kilogram (kg)  
 1000 milligram (mg) = 1 gram (g)  
 1000 grams (g) = 1 kilogram (kg)  
 1000 kilograms (kg) = 1 tonne (t)

**Conversion :**



Order of operations when simplifying an expression : eg Simplify  $2 \times (5 + 4) - 12$

Brackets

Of

Multiplication – working from left to right

Or

Division

Addition

Or

Subtraction

} working from left to right

