

Maths Grade 1

Knowledge Organiser

1.1 Multiple, factor, prime square, cube

- **FACTORS** are what divides exactly into a number

e.g. Factors of 12 are:

1	12
2	6
3	4

- **PRIMES** have only **TWO** factors

e.g. Factors of 7 are 1 and 7

7 is PRIME

- **MULTIPLES** are the times table answers

e.g. Multiples of 5 are:

5 10 15 20 25

- **SQUARES** are the result of multiplying a number by itself

e.g. $1 \times 1 = 1$
 $2 \times 2 = 4$
 $3 \times 3 = 9$

← Square numbers

- **CUBES** are the result of multiplying a number by itself & itself again

e.g. $1 \times 1 \times 1 = 1$
 $2 \times 2 \times 2 = 8$
 $3 \times 3 \times 3 = 27$

← Cube numbers

1.2 Multiply by a two digit number

Try different methods to find which suits you

e.g. 152×34

COLUMN METHOD

$$\begin{array}{r} 152 \\ \underline{34 \times} \\ 608 \quad (\times 4) \\ 4560 \quad (\times 30) \\ \hline 5168 \end{array}$$

e.g. 152×34

GRID METHOD

	100	50	2
30	3000	1500	60
4	400	200	8

$$152 \times 34 = 3400 + 1700 + 68 = \mathbf{5168}$$

1.2 Divide by a two digit number

Try different methods to find which suits you

e.g. $4928 \div 32$ BUS SHELTER METHOD

- Divide
- Multiply
- Subtract
- Bring down - Make a new number
- Divide ...

$$\begin{array}{r}
 0154 \\
 32 \overline{) 4928} \\
 \underline{-32} \\
 172 \\
 \underline{-160} \\
 128 \\
 \underline{-128} \\
 000
 \end{array}$$

$4928 \div 32 = \mathbf{154}$

e.g. $4928 \div 32$ CHUNKING METHOD

$$\begin{array}{r}
 4928 \\
 \underline{3200} \quad 100 \times 32 \\
 1728 \\
 \underline{1600} \quad 50 \times 32 \\
 128 \\
 128 \quad 4 \times 32 \\
 \hline
 \end{array}$$

$4928 \div 32 = \mathbf{154}$

e.g. $4928 \div 32$ SHORT DIVISION METHOD

(Except write down some of your tables down first)

$$\begin{array}{r}
 32 \\
 64 \\
 96 \\
 128 \\
 160
 \end{array}
 \quad
 \begin{array}{r}
 0154 \\
 32 \overline{) 4^4 9^{17} 2^{12} 8}
 \end{array}$$

$4928 \div 32 = \mathbf{154}$

1.3 Rounding to estimate answers

- To estimate round to 1 digit greater than 0 (1 significant figure)

e.g. $35.6 \times 4.21 \approx 40 \times 4 = 160$

1.4 Fraction, decimal, percentage equivalents

LEARN THESE:

$$\frac{1}{4} = 0.25 = 25\%$$

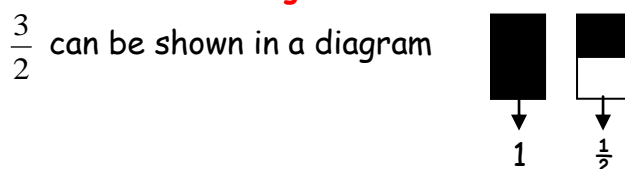
$$\frac{1}{2} = 0.5 = 50\%$$

$$\frac{3}{4} = 0.75 = 75\%$$

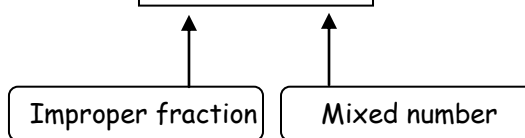
When ordering- make them all decimals

1.5 Convert mixed numbers to improper fractions & vv

- An improper fraction is top heavy & can be changed into a mixed number



$$\frac{3}{2} = 1\frac{1}{2}$$



- A mixed number can be changed back into an improper fraction

$$1\frac{1}{2} = \frac{3}{2}$$

1.6 Simple ratio

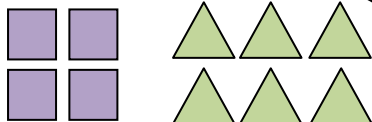


The ratio of squares to triangles

can be written

squares : triangles

4 : 6



÷ 2

÷ 2

2 : 3

Ratios can be simplified just like fractions

1.9 Write algebraic expressions

No 'x' or '÷' signs in algebra

2xa is written 2a

axb is written ab

axa is written a^2

$a \div 2$ is written $\frac{a}{2}$

1.10 Simply algebraic expressions

Like terms can be added and subtracted

e.g. $2a + 3a = 5a$

$6y - 2y = 4y$

y^2 and y are UNLIKE terms

1.7 Balancing number equations

- Use balancing:

$$20 + \square = 20 \times 4$$

$$20 + \square = 80$$

$$20 + \boxed{60} = 80 \quad (80 - 20 = 60)$$

1.11 Using a word formula

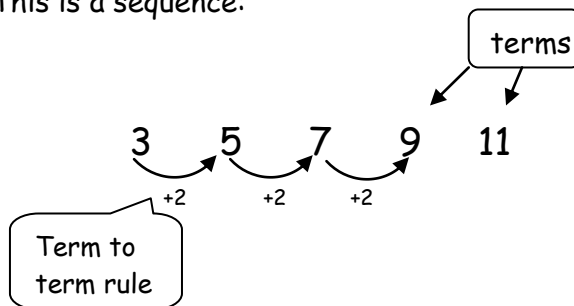
Read the word formula carefully and follow the worded instructions

1.12 Number Patterns

- A list of numbers with a pattern is called a **SEQUENCE**
- The numbers are called **TERMS**
- A **'TERM TO TERM RULE'** tells you how to get from one term to the next

It might be add, subtract, multiply or divide by something

This is a sequence:



1.8 Add & subtract decimals

- Line up the digits and the decimal points

e.g. $28.5 + 0.37 + 7$

$$\begin{array}{r} 28.5 \\ 0.37 \\ 7 \\ \hline 35.87 \end{array}$$

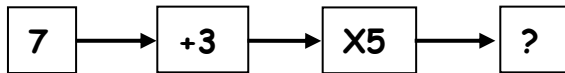
1.8 Multiply a decimal

e.g. 28.5×3

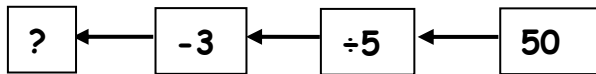
$$\begin{array}{r} 28.5 \\ \underline{213} \times \\ 85.5 \end{array}$$

1.13 Number machines

e.g. Given INPUT, find OUTPUT



e.g. Given OUTPUT, find INPUT



Use INVERSE OPERATIONS

- To undo ADD, just SUBTRACT

e.g. $36 + \boxed{23} = 59$ ($59 - 36 = 23$)

- To undo MULTIPLY, just DIVIDE

e.g. $7 \times \boxed{3} = 21$ ($21 \div 7 = 3$)

1.14 Solve equations

- Find a number to replace the letter
- Check to make sure it works

e.g. $\frac{y}{5} = 4$

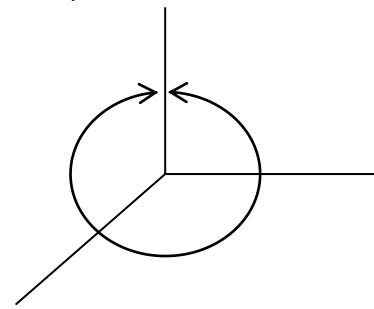
Y must be 20 because $20 \div 5 = 4$

1.15 Coordinates in 4 quadrants

- The number off the x-axis is first in the bracket (x, y)
- Mark a point accurately with a cross
- Put its letter in front

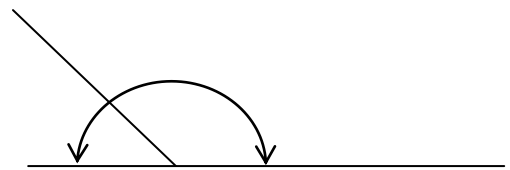
1.16 Angles about a point

These add up to 360°

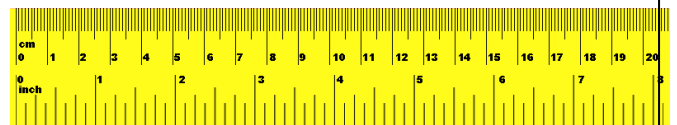


1.16 Angles on a straight line

These add up to 180°



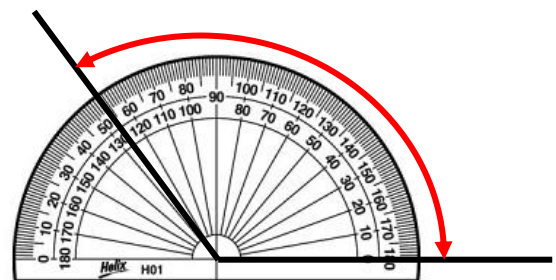
1.19 Use a ruler accurately



Measure from 0

This line is 14.7cm long

Use a protractor accurately



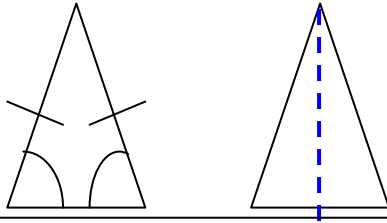
Count the number of degrees between the 2 arms of the angle. This angle is 127°

1.17 Properties of 2D shapes

TRIANGLES - angles add up to 180°

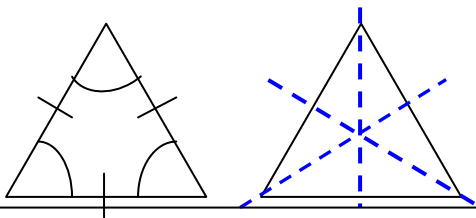
Isosceles triangle

- 2 equal sides
- 2 equal angles
- 1 line of symmetry
- No rotational symmetry



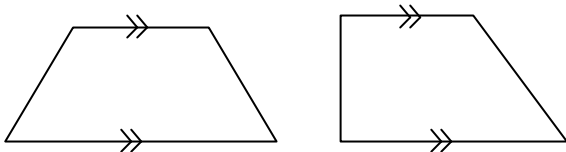
Equilateral triangle

- 3 equal sides
- 3 equal angles - 60°
- 3 lines of symmetry
- Rotational symmetry order 3



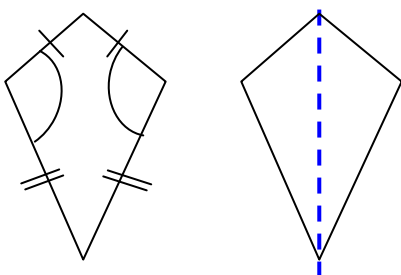
Trapezium

- ONE pair opposite sides parallel



Kite

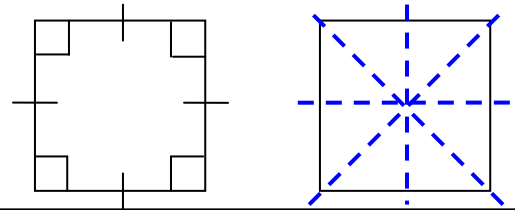
- One pair of opposite angles equal
- 2 pairs of adjacent sides equal
- ONE line of symmetry
- No rotational symmetry



QUADRILATERALS - all angles add up to 360°

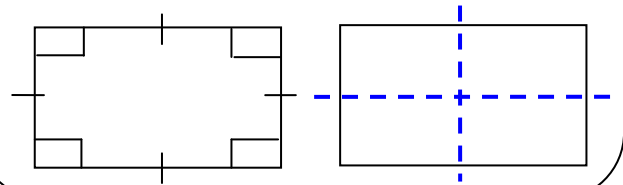
Square

- 4 equal sides
- 4 equal angles - 90°
- 4 lines of symmetry
- Rotational symmetry order 4



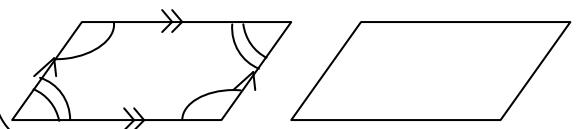
Rectangle

- Opposite sides equal
- 4 equal angles - 90°
- 2 lines of symmetry
- Rotational symmetry order 2



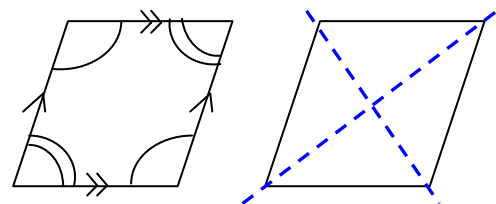
Parallelogram

- Opposite sides parallel
- Opposite angles equal
- NO lines of symmetry
- Rotational symmetry order 2



Rhombus (like a diamond)

- Opposite sides parallel
- Opposite angles equal
- 2 lines of symmetry
- Rotational symmetry order 2

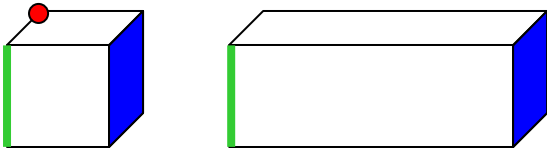


1.17 Properties of 3D shapes

PRISMS- same cross section through length

Cube and cuboid

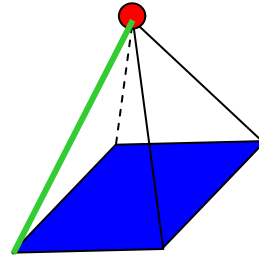
- 6 faces
- 12 edges
- 8 vertices



PYRAMIDS- a point opposite the base

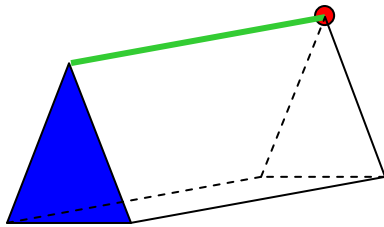
Pyramid - square based

- 5 faces
- 8 edges
- 5 vertices



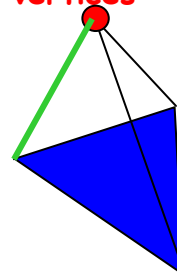
Triangular prism

- 5 faces
- 9 edges
- 8 vertices

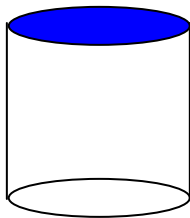


Pyramid - triangular based

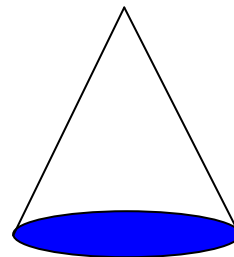
- 4 faces
- 6 edges
- 4 vertices



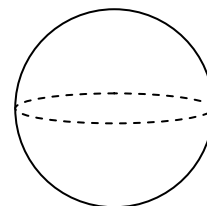
Cylinder - special prism



Cone - special pyramid



SPHERES- ball shape



TRANSFORMATIONS

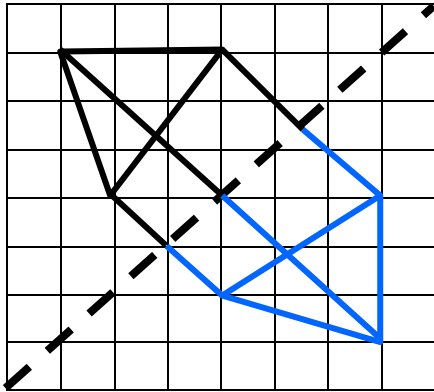
1.18 Reflect in a mirror line

- To reflect a shape in a 45° line

Distances from shape to mirror and mirror to reflection must be same

Tracing paper is useful:

1. Trace the shape & the mirror line
2. Flip the tracing paper over the mirror line
3. Redraw the shape in its new position

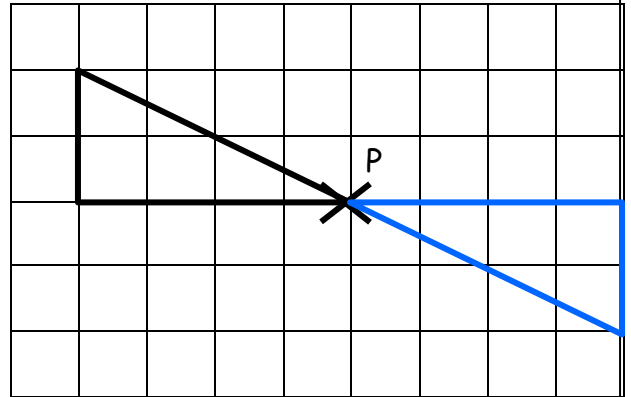


1.18 Rotate a shape

- To rotate a shape 180° about P

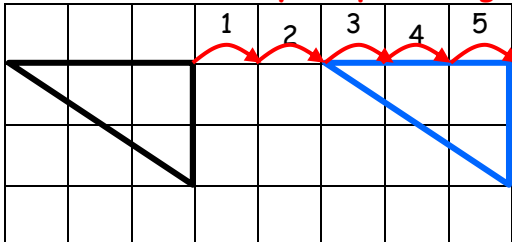
Tracing paper is useful:

1. Trace the shape
2. Hold the shape down with a pencil
3. Rotate tracing paper
4. Redraw the shape in its new position

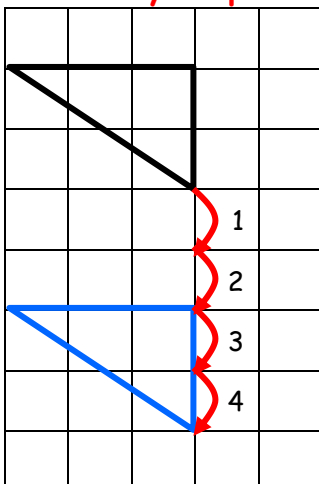


1.18 Translate a shape

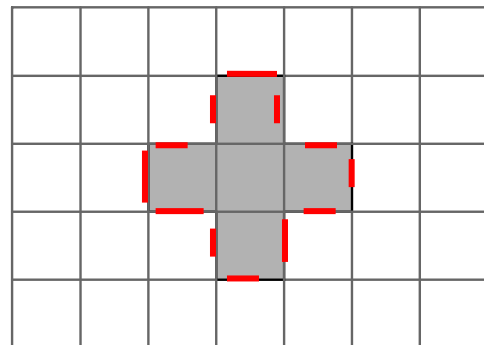
- Move horizontally 5 spaces right



- Move vertically 4 spaces down

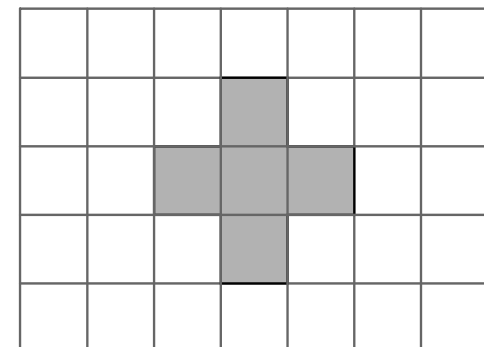


1.20 Find perimeter of simple shapes



Perimeter is round the **OUTSIDE**

Perimeter of this shape = 12cm

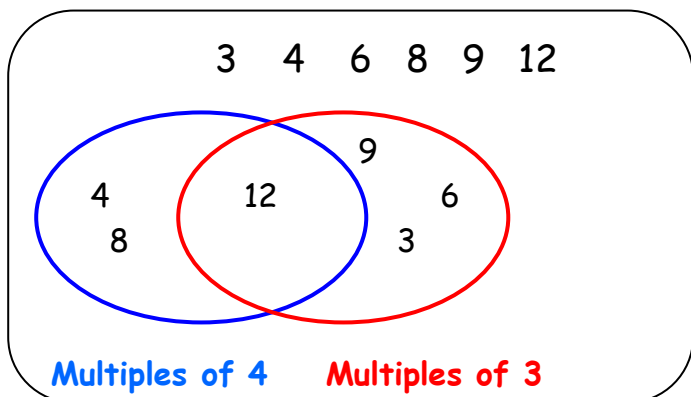


Area is the number of squares **INSIDE**

Area of this shape = 5cm^2

1.21 Use a Venn Diagram

- To place these numbers onto a Venn diagram



1.21 Use a Carroll Diagram

- A Carroll diagram is also known as a 2 Way Table.
- To place numbers 1 to 20 onto a Carroll diagram

	Square number	Not a square number
Even	4 16	2 6 8 10 12 14 18 20
Odd	1 9	3 5 7 11 13 15 17 19

1.22 Mode and Range

- Mode is the most frequent measure
- Range is (highest - lowest) measure

Example

1, 5, 3, 4, 3, 7, 3, 3, 5,

Mode = 3 (There are 4 of them)

Range = 7 - 1 = 6

Example 2

1, 5, 3, 4, 3, 7, 3, 5, 5,

Mode = 3 or 5

(There are 3 of each of them. You are allowed 2 modes. This is called Bi-Modal)

Example 3

1, 4, 3, 4, 3, 7, 2, 5, 5,

NO MODE - You are not allowed 3 modes !

1.23 Probability

- Probability words are used to describe how likely it is that an event will happen.

Examples of probability words are

- certain
- likely
- even chance
- unlikely
- impossible

Other words:

- Equally likely** - when all outcomes have the same chance of occurring
- Biased** - when all outcomes do NOT have the same chance of occurring
- Probability as a fraction**

$P(\text{event}) = \frac{\text{No. of outcomes which give the event}}{\text{Total number of outcomes}}$

THINGS EVERYONE MUST KNOW

2 x times table

1	x	2	=	2
2	x	2	=	4
3	x	2	=	6
4	x	2	=	8
5	x	2	=	10
6	x	2	=	12
7	x	2	=	14
8	x	2	=	16
9	x	2	=	18
10	x	2	=	20
11	x	2	=	22
12	x	2	=	24

4 x times table

1	x	4	=	4
2	x	4	=	8
3	x	4	=	12
4	x	4	=	16
5	x	4	=	20
6	x	4	=	24
7	x	4	=	28
8	x	4	=	32
9	x	4	=	36
10	x	4	=	40
11	x	4	=	44
12	x	4	=	48

3 x times table

1	x	3	=	3
2	x	3	=	6
3	x	3	=	9
4	x	3	=	12
5	x	3	=	15
6	x	3	=	18
7	x	3	=	21
8	x	3	=	24
9	x	3	=	27
10	x	3	=	30
11	x	3	=	33
12	x	3	=	36

5 x times table

1	x	5	=	5
2	x	5	=	10
3	x	5	=	15
4	x	5	=	20
5	x	5	=	25
6	x	5	=	30
7	x	5	=	35
8	x	5	=	40
9	x	5	=	45
10	x	5	=	50
11	x	5	=	55
12	x	5	=	60

<u>6 x times table</u>				
1	x	6	=	6
2	x	6	=	12
3	x	6	=	18
4	x	6	=	24
5	x	6	=	30
6	x	6	=	36
7	x	6	=	42
8	x	6	=	48
9	x	6	=	54
10	x	6	=	60
11	x	6	=	66
12	x	6	=	72

<u>8 x times table</u>				
1	x	8	=	8
2	x	8	=	16
3	x	8	=	24
4	x	8	=	32
5	x	8	=	40
6	x	8	=	48
7	x	8	=	56
8	x	8	=	64
9	x	8	=	72
10	x	8	=	80
11	x	8	=	88
12	x	8	=	96

<u>7 x times table</u>				
1	x	7	=	7
2	x	7	=	14
3	x	7	=	21
4	x	7	=	28
5	x	7	=	35
6	x	7	=	42
7	x	7	=	49
8	x	7	=	56
9	x	7	=	63
10	x	7	=	70
11	x	7	=	77
12	x	7	=	84

<u>9 x times table</u>				
1	x	9	=	9
2	x	9	=	18
3	x	9	=	27
4	x	9	=	36
5	x	9	=	45
6	x	9	=	54
7	x	9	=	63
8	x	9	=	72
9	x	9	=	81
10	x	9	=	90
11	x	9	=	99
12	x	9	=	108

<u>10 x times table</u>				
1	x	10	=	10
2	x	10	=	20
3	x	10	=	30
4	x	10	=	40
5	x	10	=	50
6	x	10	=	60
7	x	10	=	70
8	x	10	=	80
9	x	10	=	90
10	x	10	=	100
11	x	10	=	110
12	x	10	=	120

<u>12 x times table</u>				
1	x	12	=	12
2	x	12	=	24
3	x	12	=	36
4	x	12	=	48
5	x	12	=	60
6	x	12	=	72
7	x	12	=	84
8	x	12	=	96
9	x	12	=	108
10	x	12	=	120
11	x	12	=	132
12	x	12	=	144

<u>11 x times table</u>				
1	x	11	=	11
2	x	11	=	22
3	x	11	=	33
4	x	11	=	44
5	x	11	=	55
6	x	11	=	66
7	x	11	=	77
8	x	11	=	88
9	x	11	=	99
10	x	11	=	110
11	x	11	=	121
12	x	11	=	132

You **MUST** know your tables.

You need to recite them in a sing song way to help you remember them.

For example;

"One 3 is 3,
Two 3's are 6,
Three 3's are 9,
Four 3's are 12, . . . "

You will be tested.
You must know them.
You **CAN** do this.

Practise until you do.