

MATHS: Module 3

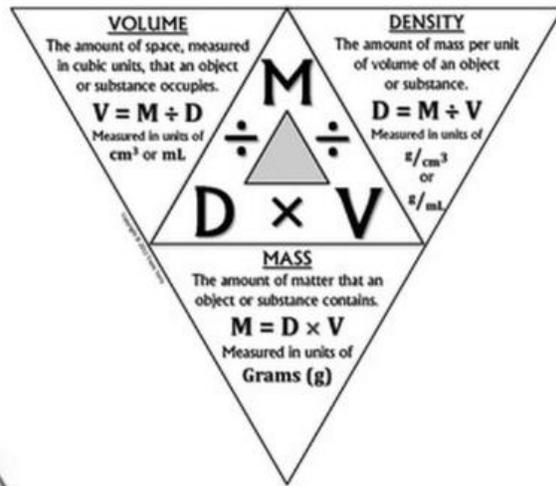
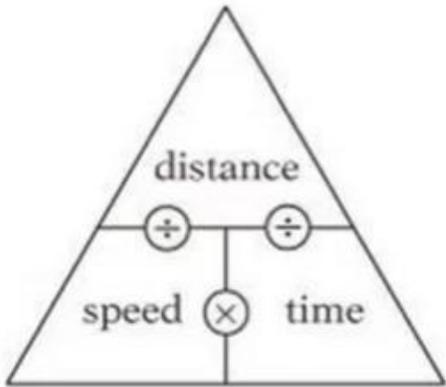
Calculations 1

Expressions

Angles and Polygons

Handling Data 2

Measures and accuracy



Equations and inequalities

$$8a - 5 = 11$$

$$+ 5 \quad + 5$$

$$8a = 16$$

$$\div 8 \quad \div 8$$

$$a = 2$$

Variable Terms Constant Terms

$$5x - 2 = 3x + 4$$

$$-3x \quad -3x$$

$$2x - 2 = 4$$

$$+2 \quad +2$$

$$2x = 6$$

$$x = 3$$

Keywords	Definition/Tips	Example
Rounding	If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.	74 rounded to the nearest ten is 70, because 74 is closer to 70 than 80. 152,879 rounded to the nearest thousand is 153,000.
Decimal Place	The position of a digit to the right of a decimal point.	In the number 0.372, the 7 is in the second decimal place. 0.372 rounded to two decimal places is 0.37, because the 2 tells us to round down. Careful with money - don't write £27.4, instead write £27.40
Significant Figure	The significant figures of a number are the digits which carry meaning (ie. are significant) to the size of the number. The first significant figure of a number cannot be zero. In a number with a decimal, trailing zeros are not significant.	In the number 0.00821, the first significant figure is the 8. In the number 2.740, the 0 is not a significant figure. 0.00821 rounded to 2 significant figures is 0.0082. 19357 rounded to 3 significant figures is 19400. We need to include the two zeros at the end to keep the digits in the same place value columns.
Truncation	A method of approximating a decimal number by dropping all decimal places past a certain point without rounding.	3.14159265... can be truncated to 3.1415 (note that if it had been rounded, it would become 3.1416)
Error Interval	A range of values that a number could have taken before being rounded or truncated. Written using inequalities, with a lower bound (\leq) and an upper bound ($<$).	0.6 has been rounded to 1 decimal place. The error interval is: $0.55 \leq x < 0.65$ The lower bound is 0.55 The upper bound is 0.65
Estimate	To find something close to the correct answer.	An estimate for the height of a man is about 1.8 metres.
Approximation	When using approximations to estimate the solution to a calculation, round each number in the calculation to 1 significant figure. \approx means 'approximately equal to'	$\frac{348 + 692}{0.526} \approx \frac{300 + 700}{0.5} = 2000$ 'Note that dividing by 0.5 is the same as multiplying by 2'

$5 < 10$
5 is less than 10

$x \leq 10$
x is less than 10 or equal to 10

$10 > 5$
10 is greater than 5

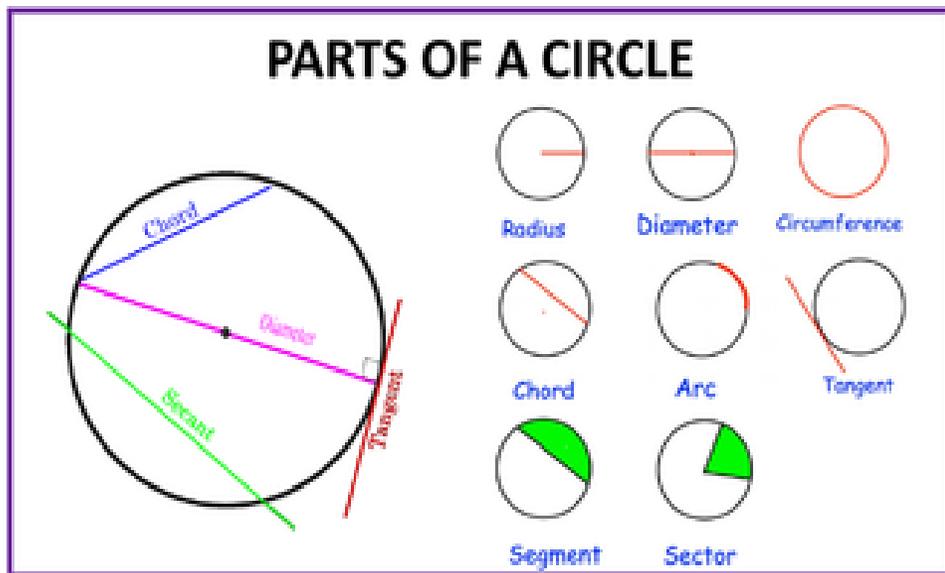
$x \geq 15$
x is greater than 15 or equal to 15

If x is **between** two values, use **two circles**:



$$1 < x \leq 6$$

Circles



Radius is **half** the diameter

Diameter is **double** the radius

It takes 3.14..... lots of the diameter to create the circumference (known as **pi** or π)

Example of Area

$$\text{Area} = \pi r^2$$

$$\text{Area} = \pi \times 3 \times 3$$

$$\text{Area} = 9\pi \text{ or } 28.27\text{cm}^2 \text{ (2dp)}$$

Example of circumference

$$\text{Circumference} = \pi d \text{ or } 2\pi r$$

$$\text{Circumference} = 6\pi \text{ or } 2 \times 3 \times \pi$$

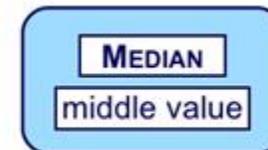
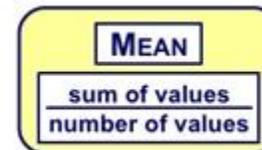
$$= 18.85\text{cm}$$

Handling Data 1

Midpoint of two values

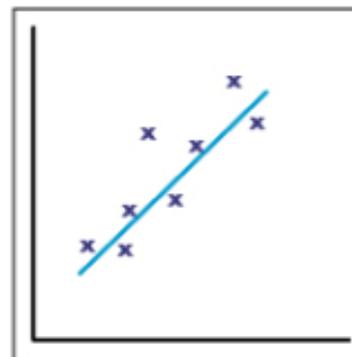
$$(4 + 5) \div 2$$

4.5



Correlation

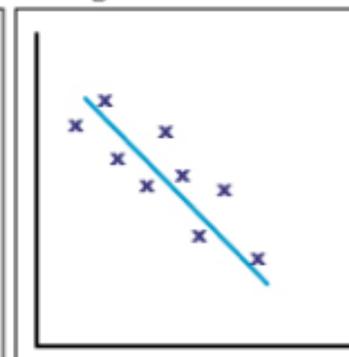
Positive correlation



The points lie close to a straight line, which has a positive gradient.

This shows that as one variable **increases** the other **increases**.

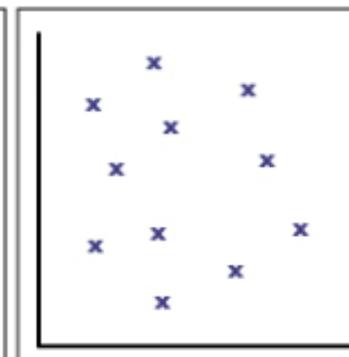
Negative correlation



The points lie close to a straight line, which has a negative gradient.

This shows that as one variable **increases**, the other **decreases**.

No correlation



There is no pattern to the points.

This shows that there is **no connection** between the two variables.