

Year 7 Half Term 1 Knowledge Organiser

Rounding

Rounding to a given number of 1 decimal places

To do this put a line in 1 **number** after the **decimal point** (after the tenths). If the **number** after this line is less than 5 **round down**, or **round up** if the **number** is 5 or above.

Rounding to 1 significant figure.

The first non zero number is the first significant figure. All numbers after this should be zero.

Negative numbers:

Negative number- a number less than zero

$$+ + = +$$

$$3 + 4 = +7$$

$$-2 + 8 = +6$$

$$- - = +$$

$$3 - 4 = -1$$

$$-2 - 8 = -10$$

$$+ - = -$$

$$3 - 4 = -1$$

$$-2 - 8 = -10$$

$$- + = -$$

$$3 + 4 = +7$$

$$-2 + 8 = +6$$

Integer- whole number

Square number- multiply an integer by itself.

Cube number- multiply an integer by itself 3 times.

Sum- The result of adding two or more numbers.

Product- The answer when two or more values are multiplied together.

Prime- a number with 2 factors 1 and itself.

Place value:

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

Even number- divisible by 2

Odd number- not divisible by 2

BIDMAS

B	Brackets
I	Indices
D	Division
M	Multiplication
A	Addition
S	Subtraction

Perimeter

The perimeter is the distance around the outside or edge of a shape or area.

It can be measured in mm, cm, m or km

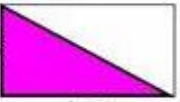
Year 7 Half Term 2 Knowledge Organiser

rectangle



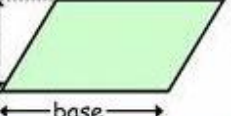
Area = base $\times$ height

triangle is half the area of a rectangle



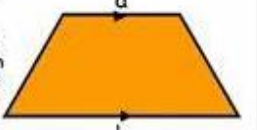
Area = $\frac{\text{base} \times \text{height}}{2}$

parallelogram



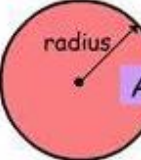
Area = base $\times$ height

trapezium



Area = $\frac{(a + b) \times h}{2}$

circle



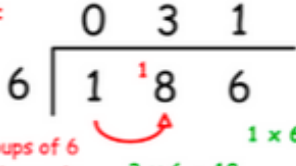
Area = πr^2

AREA

Always use the **perpendicular height**

Important vocabulary	
Factor	Numbers we can multiply together to get another number
Multiple	The result of multiplying a number by an integer (not by a fraction).
Prime	A number which is divisible by 1 and itself. A Prime number has 2 factors, itself and 1.
Highest Common Factor (HCF)	The highest number that divides exactly into two or more numbers.
Lowest Common Multiple (LCM)	The smallest positive number that is a multiple of two or more numbers.

Division-

$$186 \div 6 =$$


no groups of 6 can be made

$3 \times 6 = 18$

$1 \times 6 = 6$

Multiplication-

Multiply the ones first.

$$\begin{array}{r} 34 \\ \times 5 \\ \hline 20 \end{array}$$

$$5 \times 4 = 20$$

Then multiply the tens and place the result underneath. Remember, the 3 in 34 is signifying 30.

$$\begin{array}{r} 34 \\ \times 5 \\ \hline 20 \\ 150 \end{array}$$

$$5 \times 30 = 150$$

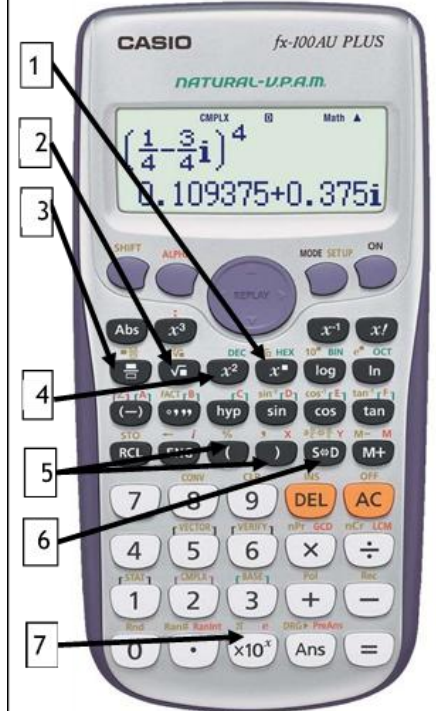
Then add.

$$\begin{array}{r} 34 \\ \times 5 \\ \hline 20 \\ + 150 \\ \hline 170 \end{array}$$

Prime numbers:
2,3,5,7,11,13,17,19,
23,29

Square numbers:
1,4,9,16,25,36,49,64,
81,100,121,144,169,
196,225

3. Using a calculator

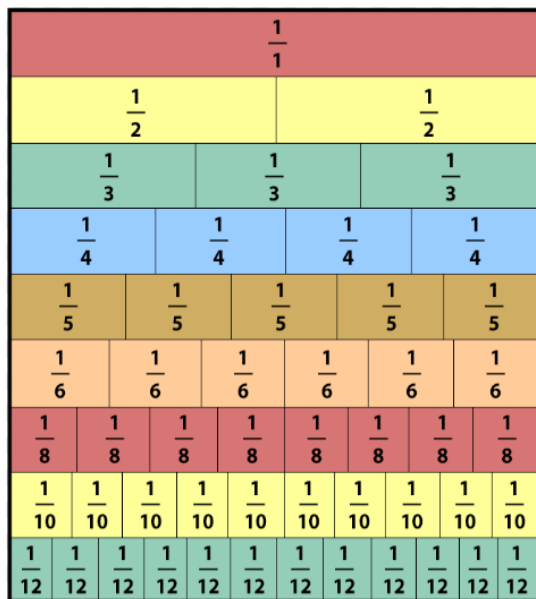


1	Indices or Root (shift + button)
2	Square root
3	Fraction
4	Square
5	Brackets
6	SD button (changes from decimal to fraction)
7	Pi (shift + button)

Year 7 Half Term 3 Knowledge Organiser

Fractions

Fraction wall

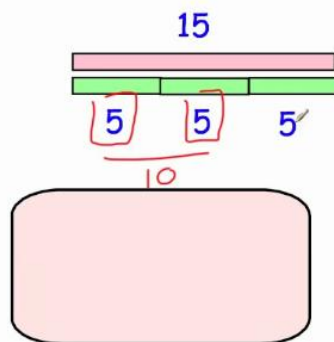


Fraction of an amount

$\frac{2}{3}$ of 15

$15 \div 3 = 5$

$2 \times 5 = 10$



Inequality Symbols	
$\neq$	not equal
$<$	less than
$\leq$	less than or equal to
$>$	greater than
$\geq$	greater than or equal to

Compare Fractions

Using Cross Multiplication

Example:

$5 \times 4 = 20$ $\frac{4}{7}$ $\frac{3}{5}$ $7 \times 3 = 21$

20 $<$ 21

$7 \times 2 = 14$ $\frac{2}{3}$ $\frac{4}{7}$ $3 \times 4 = 12$

14 $>$ 12

$5 \times 4 = 20$ $\frac{4}{10}$ $\frac{2}{5}$ $10 \times 2 = 20$

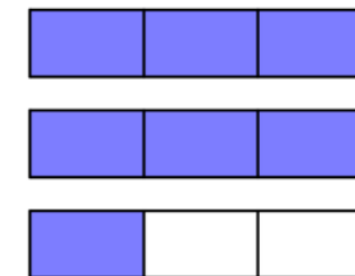
20 $=$ 20

Improper Fraction
Numerator > Denominator

$$\frac{7}{3}$$

Mixed Number

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



Adding & Subtracting fractions

- (a) These fractions do not have the same denominator, so the first step is to change them so that they do. In this case, we can use 20 as the common denominator.

$$\frac{1}{4} + \frac{2}{5} = \frac{5}{20} + \frac{8}{20} = \frac{5+8}{20} = \frac{13}{20}$$

- (b) In this case we can use a common denominator of 12.

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12} = \frac{8-3}{12} = \frac{5}{12}$$

Year 7 Half Term 4 Knowledge Organiser

Algebra Definitions	
Variable	A quantity represented by a letter
Term	A single number, variable or numbers and variables multiplied together
Expression	A mathematical statement without an equals sign
Equation	A mathematical statement with an equals sign
Expand	Multiply out the bracket in the expression
Factorise	Rewrite an expression with brackets
Substitute	Replace a variable with a number

Collecting Like Terms

Ex1 $x + 4y + 6x + 2y = 7x + 6y$

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

Ex2 $5a + 3b + 3 - 2a - b + 5$

Ex4 $2a + 3b - 6a + 2b$

Ex5 $x + 2y - 4 + 2x + 3y + 9$

Expand Single Bracket

$$3(a + 4) + 4(a + 2)$$

$$3a + 12 + 4a + 8$$

$$= 7a + 20$$

BIDMAS

B	Brackets
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Substitution

Substitution means replacing the variables in an algebraic expression with numerical or algebraic values.

E.g.
Find the value of $3b + 4$ when $b = 10$

$3b$ means $3 \times b = 3 \times 10 = 30$

So $3b + 4 = 30 + 4 = 34$



How to use key Facts

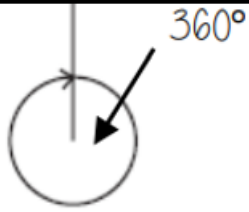
[Look through](#)
[These examples](#)

Factorise	Answer
$7x + 14$	$7(x + 2)$
$45 - 27k$	$9(5 - 3k)$
$12ab + 7b$	$b(12a + 7)$

Year 7 Half Term 5 Knowledge Organiser

Sum of angles at a point

The sum of angles around a point is 360°



Sum of angles on a straight line

Adjacent angles that share a common point on a line add up to 180°

Sum of angles in triangles

Sum of interior angles in a triangle = 180°

Vertically opposite angles

Vertically opposite angles are the same



360°

Sum of angles in quadrilaterals

Sum of interior angles in a quadrilateral = 360°

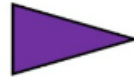
The order of rotational symmetry is that an object has the number of times that it fits on to itself during a full rotation of 360 degrees.

Types of Triangles

There are many different types of triangles. Triangles can be classified by their angles or by their sides.

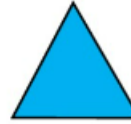
Acute Triangle

All three angles are acute (less than 90°).



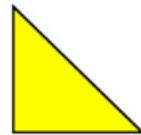
Equilateral Triangle

All three sides are congruent (same size).



Right Triangle

One of the angles is a right angle (90°).



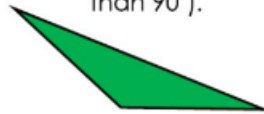
Isosceles Triangle

Two sides are congruent (same size).



Obtuse Triangle

One of the angles is an obtuse angle (greater than 90°).



Scalene Triangle

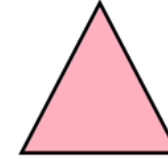
No sides are congruent (same size).



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Names of 2D Shapes



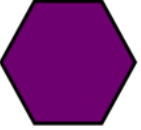
triangle
3 Sides



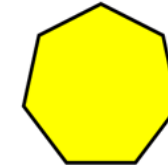
quadrilateral
4 Sides



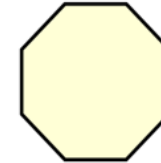
pentagon
5 Sides



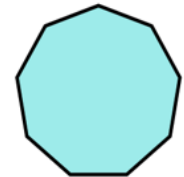
hexagon
6 Sides



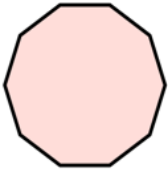
heptagon
7 Sides



octagon
8 Sides

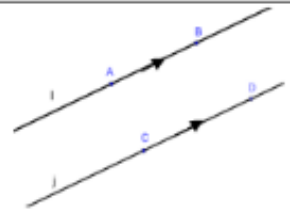


nonagon
9 Sides

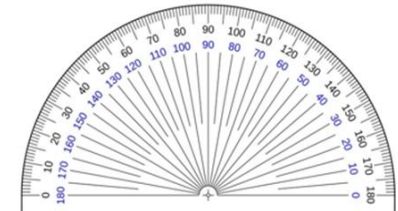


decagon
10 Sides

Parallel lines never cross and stay the same distance apart. They are coplanar. They have 0 points in common.

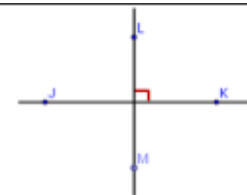


Using a protractor – always measure from zero



Perpendicular lines

intersect at right angles. They have one point in common.



Year 7 Half Term 6 Knowledge Organiser

Averages

- **Mean:** the average, which is found by adding up all the values in a set of data and dividing it by the total number of values you added together.
- **Median:** the middle number in the set of values. You find it by putting the numbers in order from the smallest to largest and covering up one number on each end until you get to the middle.
- **Mode:** the number or value, which appears most often in the set. To find the mode, you need to count how many times each value appears.
- **Range:** the difference between the lowest and the highest value. To work it out, simply subtract the lowest value from the highest.

2 way table- shows the frequency of data which satisfies two variables.

	Like Skateboards	Do Not Like Skateboards	Totals
Like Snowmobiles	80	25	105
Do not like Snowmobiles	45	10	55
Totals	125	35	160

Sequences:

- **Sequence:** a number pattern
- **Term :** a number contained in a sequence
- **First term:** the first number in a sequence
- **Term-to-term rule:** describes how to get from one term to the next
- **Nth term –** the rule that allows us to find any term in a sequence

Coordinates

Coordinates are plotted on a **pair of axes** and show the exact **position** of a **point**.

Each axis is labelled with a **scale** of numbers, like a number line.

The values can be **positive** or **negative**.

(0,0) is the point where both axes cross. It is called the **origin**. The position of a coordinate is shown using an X.

There are two axes:

- The **x axis** is left to right (**horizontal**)
- The **y axis** is bottom to top (**vertical**)

