Year 8 Autumn 1

Significant Figures

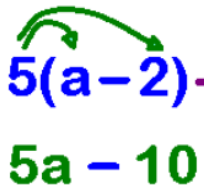
Expression, Equation or Formula?

Expressions: Algebra with no equals sign, eg: 2x+3y

Equations: Two expressions that are equal, eg: 3x+4=2x-5

Formula: A Rule or fact with mathematical symbols, eg: v = u + at

Expanding Brackets



Factorising

$4a - 6$

Common factor = 2

$4a - 6$

÷2 ÷2

$2a - 3$

$2(2a - 3)$

Truncation

47·3|12 --> 47·3

47·3|87 --> 47·3

Error Bounds

6.1 rounded to 1dp

6.0 ↓ 6.05 6.1 ↓ 6.15 6.2

Addition/Multiplication

Upper: upper and upper

Lower: lower and lower

Subtraction/Division

Upper: Upper and lower

Lower: Lower and Upper

Simplifying Algebra

$x + 4y + 6x + 2y \equiv 7x + 6y$

$3x + y - 2x + 4y \equiv x + 5y$

Rounding

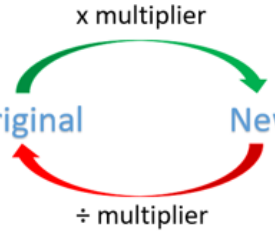
round 7.63 to 1 decimal place

7.63

3 is less than 5 (half way) so round down

7.63 rounded to 1 decimal place is 7.6

Percentages



Expanding Expressions

$(x+7)(x-4)$

$x^2 - 4x + 7x - 28$

$x^2 + 3x - 28$

$(x-7)(x+7)$

$x^2 + 7x - 7x - 49$

$x^2 - 49$

Factorising Quadratics

$n^2 + 7n + 10$

Add to: 1×10, 2×5

Factors: (n+2)(n+5)

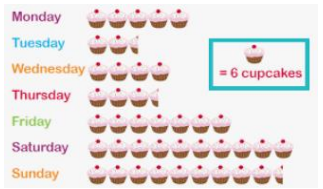
Simple Interest

Interest is calculated on the original investment, then multiplied by the number of years the money is invested.

Fractions, Decimals and Percentages

Decimal	Percentage	Fraction
0.5	50%	$\frac{1}{2}$
0.25	25%	$\frac{1}{4}$
0.75	75%	$\frac{3}{4}$
0.2	20%	$\frac{1}{5}$
0.1	10%	$\frac{1}{10}$
$0.\dot{3}$	$33.\dot{3}\%$	$\frac{1}{3}$

Pictogram



Tally

1	I
2	II
3	III
4	IIII
5	𝍸

Rounding 10 / 100 / 1000

Circle the number you are rounding

Look to the number on the right.

5 or above: round up

4 or below: stay the same

Estimating

Round to 1 significant figures

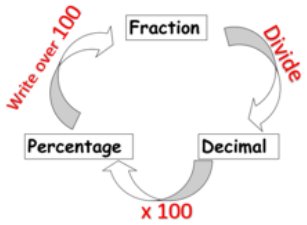
562 → 600

233 → 200

600 x 200 = 120,000

Percentage Change

$$\frac{change}{original\ amount} \times 100$$



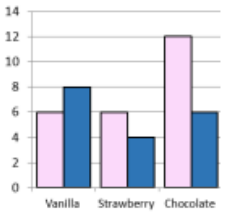
Two-way table

	Baseball	Basketball	Football	Total
Male	13	15	20	48
Female	23	16	13	52
Total	36	31	33	100

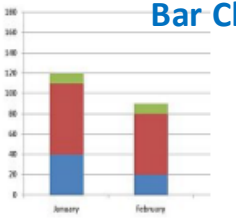
A two way table represents two sets of data.

Look for rows or columns with only one figure missing.

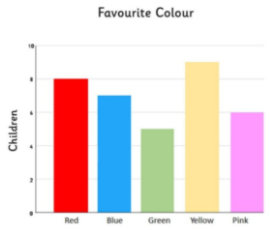
Bar Chart



Comparative bar charts show data side by side



Compound bar charts show data stacked



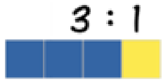
Percentages – Non-Calculator

Non-calculator	50% ÷2	25% ÷4	10% ÷10
5% ÷10 ÷2	1% ÷100	75% 50% + 25%	20% 10% + 10%

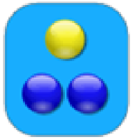
Year 8 Autumn 2

Ratio

Ratio compares the size of one part to another part.



Proportion compares the size of one part to the size of the whole.



$\frac{1}{3}$

Divide all parts of the ratio by the highest common factor.

16 : 20 (÷4, ÷4) → 4 : 5

Combining Ratio

Write out the ratio's. Find the LCM of 2 and 5. Multiply the other part of the ratio by the same number.

Men	:	Children	:	Women
3	:	2		
		5	:	4
15	:	10	:	8

(× 5, × 2)

Sharing in a Ratio

Share £60 in the ratio 3 : 2 : 1.

3 + 2 + 1 = 6

60 ÷ 6 = 10

3 x 10 = 30, 2 x 10 = 20, 1 x 10 = 10

£30 : £20 : £10

Map Scales

Map scale 1 : 10 000

(1cm on the map = 10 000 cm in real life)

3cm on the map

1 : 10 000

3cm : 30 000cm

Now convert it into m

30 000 cm ÷ 100 = 300m

1 : n

2 : 7 (÷2, ÷2) → 1 : 3.5

Fractions

Adding/Subtracting

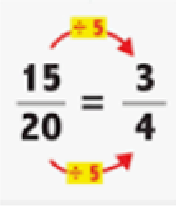
$\frac{1}{2} + \frac{1}{3} = ?$

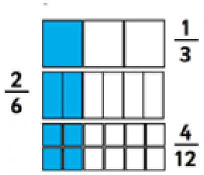
$\frac{1 \times 3}{2 \times 3} = \frac{3}{6}$ $\quad \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$

$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

$\frac{2}{4} \times \frac{3}{6} = \frac{6}{24}$

Equivalent fractions





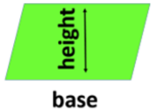
Dividing

$\frac{3}{4} \div \frac{2}{7}$

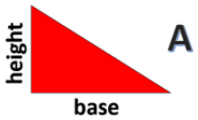
Keep $\frac{3}{4}$ — Change × — Flip $\frac{7}{2}$ $= \frac{21}{8}$

Area

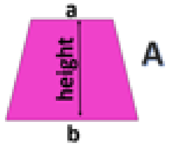
$A = bh$



$A = bh$

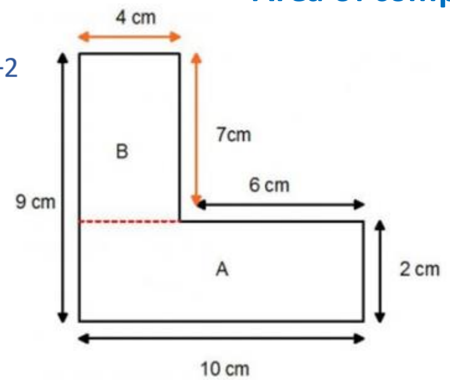


$A = \frac{bh}{2}$



$A = \frac{1}{2}(a+b)h$

Area of compound shapes



Split the shape.

Find the area of each shape then add them together.

A: 10cm x 2cm = 20cm^2

B: 7cm x 4cm = 28cm^2

Total Area: 20 + 28 = 48cm^2

Best Buy

160g = 188p (÷ 160, ÷ 160) → 1g = 1.175p

1000g = 1355p (÷ 1000, ÷ 1000) → 1g = 1.355p

Currency Exchange

British Pound	1.00 GBP
Euro	1.24
US Dollar	1.68

£200 in Euros is:

200 x 1.24 = 248 Euros

200 US Dollars in Pounds is:

200 ÷ 1.68 = £119.05

Recipes

Ingredients to make **16** gingerbread men

180 g	flour
40 g	ginger
110 g	butter
30 g	sugar

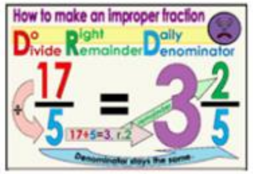
Recipe for 32 people

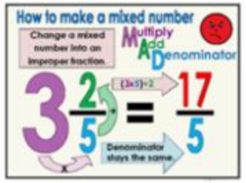
Double the recipe

Recipe for 24 people

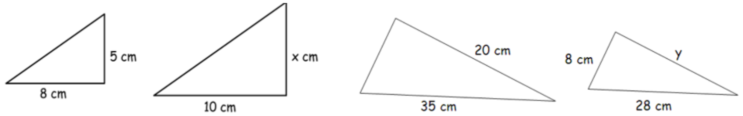
Find a half and add on

Mixed Numbers & Improper Fractions





Similarity



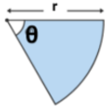
Scale Factor = 10 ÷ 8 = 1.25

x = 5 x 1.25 = 6.25 cm

Scale Factor = 35 ÷ 28 = 1.25

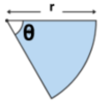
x = 20 ÷ 1.25 = 16 cm

Length of an arc



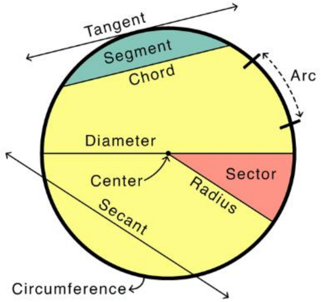
$A = \frac{\theta}{360} 2\pi r$

Area of a sector

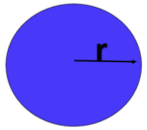


$A = \frac{\theta}{360} \pi r^2$

Parts of a circle

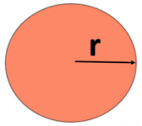


Area of a circle



$A = \pi r^2$

Circumference of a circle



$C = 2\pi r$