Year 5/6 - Place Value

@MrH_T77

Compare and order

Remember to START with the largest digits - they have the most value.

54,353 < 60,210

If the digits are the same, move down to the next

542,478 < 542,502

Remember to check the column value

99,782 < 323,251

Value of digits

Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
1	2	3	4	5	6	7	8	9

123,456,789 =

One hundred and twenty-three million,
four hundred and fifty-six thousand,
seven hundred and eighty-nine

123,000,000 + 456,000 + 789

Counting in powers of 10

Counting forwards (without bridging):

e.g. 43,534 + 1,000 = 44,534

Counting backwards (no exchanging):

e.g. 745,643 - 100 = 745,543

Counting forwards (bridging):

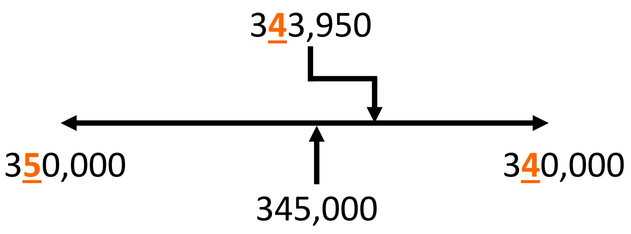
e.g 5,593 + 10 = 5,603

Counting backwards (exchanging):

e.g. 8,042,435 - 100,000 = 7,942,435

Rounding to the nearest...

E.g. Rounding to the nearest 10,000



343,950 —Nearest 10,000→ 340,000

343,950 —Nearest 1,000→ 344,000

343,950 —Nearest 100→ 344,000

343,950 —Nearest 10→ 343,950

Roman Numerals

I = 1 / V = 5 / X = 10 / L = 50

C = 100 / D = 500 / M = 1,000

XXVI = 10 + 10 + 5 + 1 = 26

XXIV = 10 + 10 + (5 – 1) = 24

Negative numbers

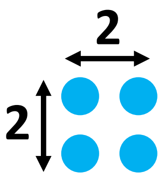
@MrH_T77

Year 5/6 - Number

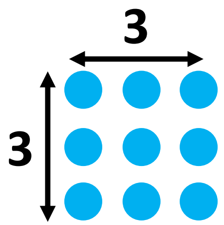
Square numbers

A square number is the product of 2 of the same number (when a number is multiplied by itself)

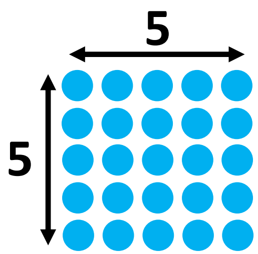
$2^2 = 2 \times 2 = 4$



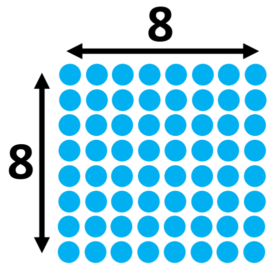
$3^2 = 3 \times 3 = 9$



$5^2 = 5 \times 5 = 25$



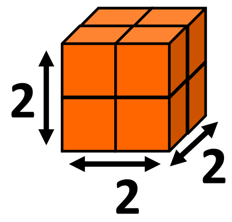
$8^2 = 8 \times 8 = 64$



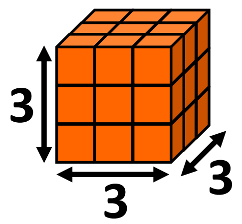
Cube numbers

A cube number is the product of three numbers

$2^3 = 2 \times 2 \times 2 = 4 \times 2 = 8$



$3^3 = 3 \times 3 \times 3 = 9 \times 3 = 27$



Prime numbers

Prime numbers are numbers (larger than 1) with only 2 factors: themselves and 1.

Numbers which are not prime are called composite numbers.

1	**2**	**3**	4	**5**	6	**7**	8	9	10
11	12	**13**	14	15	16	**17**	18	**19**	20
21	22	**23**	24	25	26	27	28	**29**	30
31	32	33	34	35	36	**37**	38	39	40
41	42	**43**	44	45	46	**47**	48	49	50
51	52	**53**	54	55	56	57	58	**59**	60
61	62	63	64	65	66	**67**	68	69	70
71	72	**73**	74	75	76	77	78	**79**	80
81	82	**83**	84	85	86	87	88	**89**	90
91	92	93	94	95	96	**97**	98	99	100

Prime numbers up to 100

Term	Definition
Sum / total	The result when two or more numbers are added together
Difference	Result when a smaller number is taken away from a larger number
Product	Result when two or more numbers are multiplied together
Quotient	Result when one number is divided by another

Other Vocabulary

Term	Definition
Operations	+ (add), - (subtract), x (multiply), ÷ (divide)
Integer	A negative or positive whole number

Term	Definition
Consecutive	Consecutive numbers are integers which follow in order (e.g. 5, 6, 7, 8, 9)
Descending Order	Numbers which are in descending order **decrease** in amount/value
Ascending Order	Numbers which are in ascending order **increase** in amount

@MrH_T77

Year 5/6 - Addition and Subtraction

Written Addition

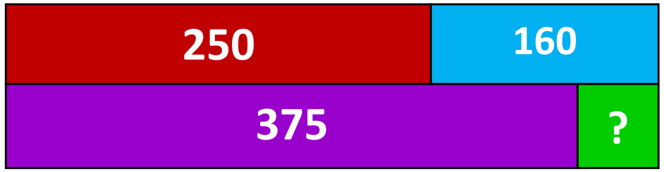
$$\begin{array}{r} 45{,}853 \\ +\ 23{,}463 \\ \hline 6 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} 45{,}853 \\ +\ 23{,}463 \\ \hline 16 \\ \hline {}^{1} \end{array} \quad \rightarrow \quad \begin{array}{r} 45{,}853 \\ +\ 23{,}463 \\ \hline ,316 \\ \hline {}^{1}\ \cancel{1} \end{array} \quad \rightarrow \quad \begin{array}{r} 45{,}853 \\ +\ 23{,}463 \\ \hline 9{,}316 \\ \hline \cancel{1}\ \cancel{1} \end{array} \quad \rightarrow \quad \begin{array}{r} 45{,}853 \\ +\ 23{,}463 \\ \hline 69{,}316 \\ \hline \cancel{1}\ \cancel{1} \end{array}$$

Multi-step problems

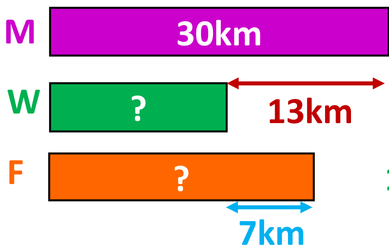
A milkman has **250 bottles of milk**.
He collects **160 more** during the morning.

During his shift, he **delivers 375 bottles**.
How many bottles are remaining?

250 + **160** - **375** = ? = **35**



On **Monday**, Sophie ran **30km**.
On **Wednesday**, she ran **13km fewer** than **Monday**. On **Friday**, she ran **7km more** than **Wednesday**. **How far did she run that week**?



30km

30km - **13km** = **17km**

17km + **7km** = **24km**

30km + **17km** + **24km** = **71km**

Written Subtraction

$$\begin{array}{r} 80{,}134 \\ -\ 33{,}241 \\ \hline 3 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} {}^{0}\quad \\ 80{,}\cancel{1}{}^{1}34 \\ -\ 33{,}241 \\ \hline 93 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} {}^{7\ 9\ 10}\quad \\ \cancel{8}{}^{1}\cancel{0},\cancel{1}{}^{1}34 \\ -\ 33{,}241 \\ \hline ,893 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} {}^{7\ 9\ 10}\quad \\ \cancel{8}{}^{1}\cancel{0},\cancel{1}{}^{1}34 \\ -\ 33{,}241 \\ \hline 6{,}893 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} {}^{7\ 9\ 10}\quad \\ \cancel{8}{}^{1}\cancel{0},\cancel{1}{}^{1}34 \\ -\ 33{,}241 \\ \hline 46{,}893 \\ \hline \end{array}$$

Mental +/-

Consider if a mental strategy would be better.
2,000 - 1,286 could be solved using written subtraction. However, counting up could be quicker.

1,286 + 4 = 1,290

1,290 + 10 = 1,300

1,300 + 700 = 2,000

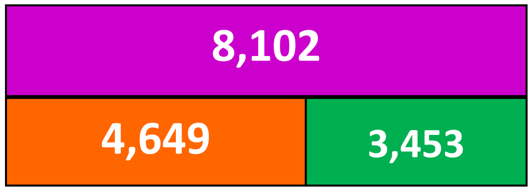
2,000 - 1,286 = 700 + 10 + 4 = 714

Inverse

3,453 + 4,649 = 8,102

8,102 - 4,649 = 3,453

8,102 - 3,453 = 4,649



@MrH_T77

Year 5/6 - Multiplication and Division

Written Multiplication

5,853
23 x
9

5,853
1 23 x
59

5,853
2 1 23 x
,559

5,853
2 1 23 x
17,559

5,853
4 1 23 x
17,559
60

→

5,853
4 1 23 x
17,559
1
,060

5,853
4 1 23 x
17,559
1 1
7,060

5,853
4 1 23 x
17,559
1 1
117,060

5,853
4 1 23 x
17,559
1 1
117,060
134,619
1 1

X and ÷ by 10 / 100 / 1,000

Each column is 10x bigger than the column before

x/÷ 10 - move up/down 1 column
x/÷ 100 - move up/down 2 columns
x/÷ 1,000 - move up/down 3 columns

45,000 ÷ 1,000 = **45**
105 x 100 = **10,500**

Multiples and factors

Multiple: Can be divided evenly by **the number**
eg. 8 / 32 / 64 / 800 are all **multiples** of **8**

Factor: Can be multiplied to create **the number**
e.g. 1 / 2 / 3 / 4 / 6 / 12 are **factors** of **12**

Mental x/÷

300 x 4 = 3 x 4 x 100 = 12 x 100 = **1,200**

720 ÷ 9 = 72 ÷ 9 x 10 = 8 x 10 = **80**

24 x 19 = 24 x 20 - 24 = 480 - 24 = **456**

Written Division

1
8 | 8,192
How many 8s in 8?
8÷8=1

1,0
8 | 8,1¹92
How many 8s in 1?
1÷8=0 r1

1,02
8 | 8,1¹9³2
How many 8s in 19?
19÷8=2 r3

1,024
8 | 8,1¹9³2
How many 8s in 32?
32÷8=4

Inverse

5,435 x **4** = **21,740**
21,740 ÷ **4** = **5,435**
21,740 ÷ **5,435** = **4**

21,740			
5,435	5,435	5,435	5,435

Order of Operation

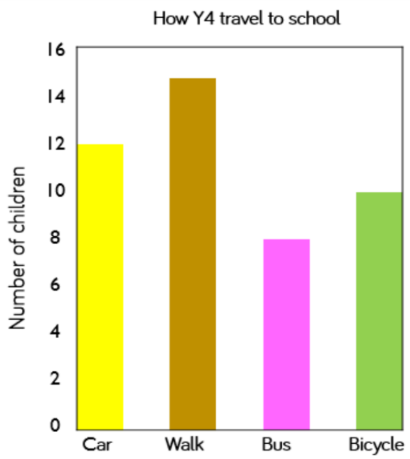
B - Brackets
I - Indices (squares, cubes)
D/M - Division / multiplication
A/S - Addition / Subtraction

(3+7)x3 = 30 3+7x3 = 24

@MrH_T77

Year 5/6 - Statistics

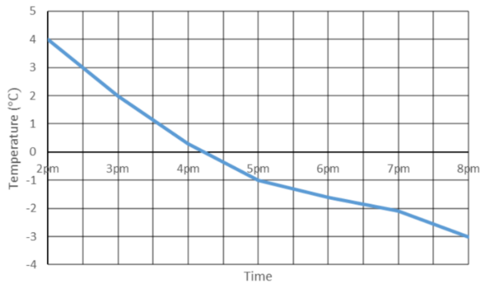
Bar and column charts



The information in a bar chart is read across. They are used to compare different data. In the above example, we can see that more children in Y4 walk to school

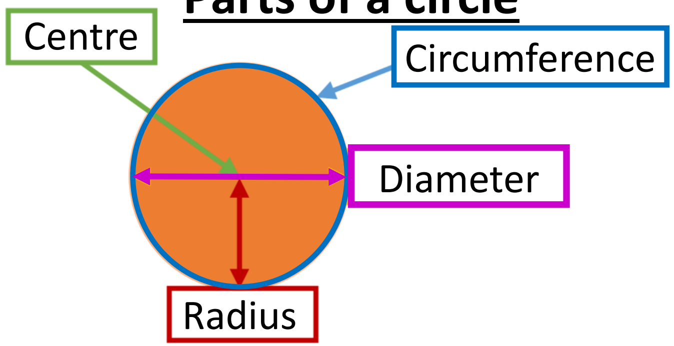
Line graphs

Line graph usually show us changes over time. They require us to read along the x and y axes.



For example, the graph above shows a temperature of around –1.5°C at 6pm, 4°C at 2pm and 1°C at 3:30pm.

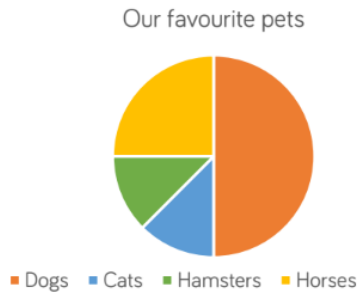
Parts of a circle



Pie charts

Pie charts compare values as parts of a whole.

96 people took part in this survey.



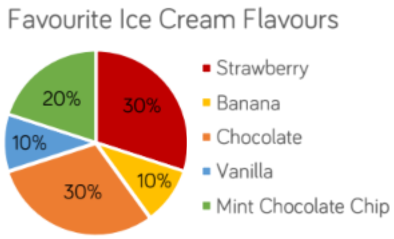
Dogs = 96 ÷ 2 = 48

Cats = 96 ÷ 8 = 12

Hamsters = 12

Horses = 96 ÷ 4 = 24

300 pupils voted for their favourite ice cream flavours



Strawberry = (300 ÷ 10) x 3 = 90

Banana = 300 ÷ 10 = 30

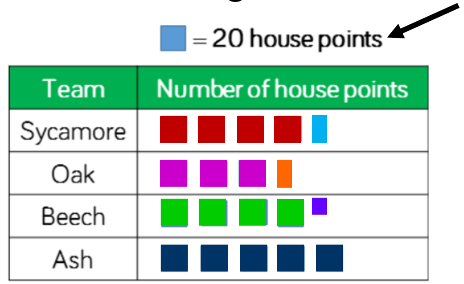
Chocolate = 90

Vanilla = 300 ÷ 10 = 30

Mint chocolate chip= (300 ÷ 10) x 2 = 60

Pictograms

In pictograms, an image is given a certain value.



Sycamore = 4 x 20 + (20 ÷ 2) = 80 + 10 = 90

Oak = 3 x 20 + (20 ÷ 2) = 60 + 10 = 70

Beech = 4 x 20 + (20 ÷ 4) = 80 + 5 = 85

Ash = 5 x 20 = 100

The mean

9 10
7 5 3
6 2

Mean = total of all the numbers ÷ the number of numbers

Total = 9 + 10 + 7 + 5 + 3 + 6 + 2 = 42

Mean = 42 ÷ 7 = 6

Two–way tables

	Boys	Girls	TOTAL
Dogs	87	44	131
Cats	38	76	114
TOTAL	125	120	245

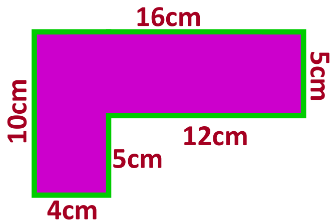
The table above shows the number of dogs and cats owned by girls and boys

@MrH_T77

Year 5/6 - Perimeter, Area and Volume

Perimeter

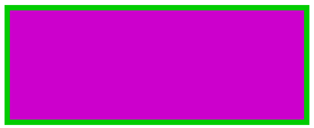
The perimeter of a shape or space is the distance around the outside.



Perimeter = 5cm + 16cm + 10cm + 4cm + 5cm + 12cm = 52cm

Area

The area of a shape is the amount of 2D space it takes up

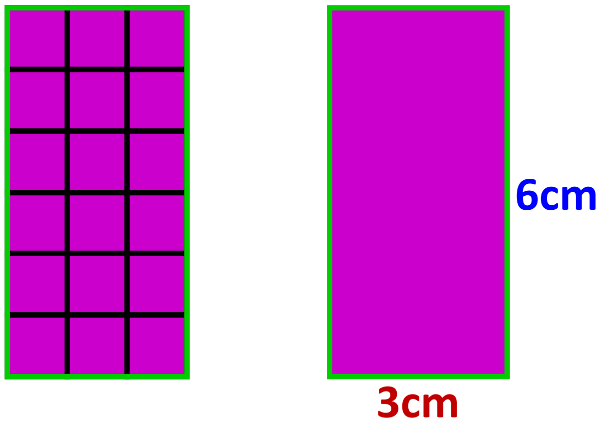


Perimeter

Area

Area of rectangle

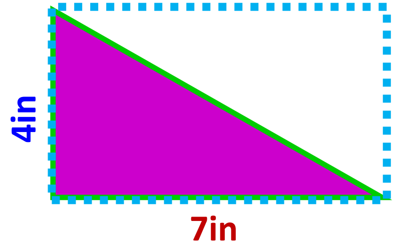
Area of rectangle = b x h



Area = 3cm x 6cm = $18cm^2$

Area of triangle

A triangle is half the size of a rectangle with the same base and height. Therefore, the area is half the size.



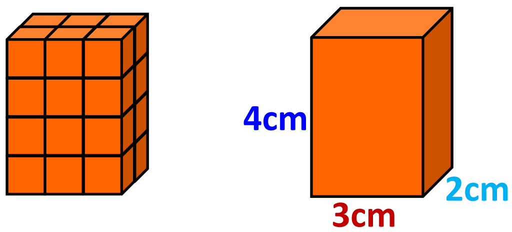
Area of triangle = b x h ÷ 2

Area = 7in x 4in ÷ 2 = $28in^2$ ÷ 2 = $14in^2$

Volume of cuboids

The volume of a cuboid is its "3D space" It can be counted as cubes or by using

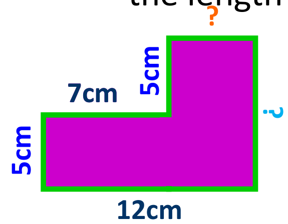
Volume of cuboid = base x height x depth



Volume = 3cm x 4cm x 2cm = $12cm^2$ x 2cm = $24cm^3$

Finding missing sides

Using the properties of shapes, we can find the length of missing sides.

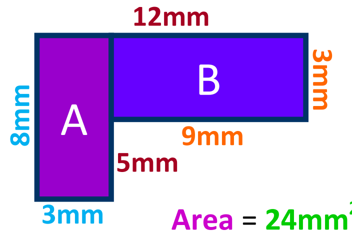


? = 12cm - 7cm = 5cm

? = 5cm + 5cm = 10cm

Area of compound shapes

To find the area of compound shapes, simply split them into shapes you can find the area of.



Area of A = 3mm x 8mm = $24mm^2$

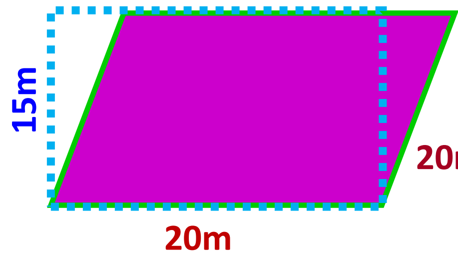
Area of B = 9mm x 3mm = $27mm^2$

Area = $24mm^2$ + $27mm^2$ = $51mm^2$

Area of Parallelogram

A parallelogram has the same area as a rectangle with the same base and height

Area of parallelogram = b x h



Area = 20m x 15m = $300m^2$

@MrH_T77

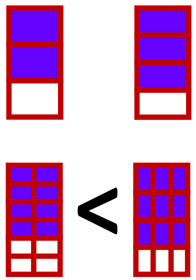
Year 5/6 - Fractions (1)

Compare and order fractions

If the **denominators** of our fractions are the same, they are easy to compare.

$\frac{2}{3} \rightarrow \frac{8}{12}$ and $\frac{3}{4} \rightarrow \frac{9}{12}$, so $\frac{8}{12} < \frac{9}{12}$

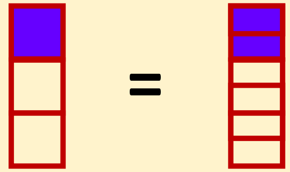
$\frac{5}{7} \rightarrow \frac{25}{35}$ and $\frac{3}{5} \rightarrow \frac{21}{35}$, so $\frac{25}{35} > \frac{21}{35}$



Equivalent fractions

As long as we multiply or divide the **numerator** and **denominator** by the same number, our fraction will be equivalent.

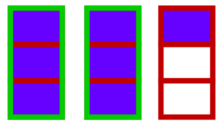
$$\frac{1}{3} = \frac{2}{6}$$



Improper and mixed numbers

Fractions which are bigger than 1.

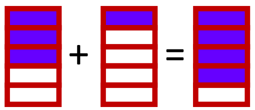
Seven thirds $\frac{7}{3}$ = $2\frac{1}{3}$ Two and one third



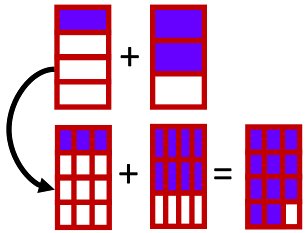
Add and subtract fractions

If the **denominators** of our fractions are the same, we just add the **numerators**.

$$\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$$



$$\frac{1}{4} + \frac{2}{3} = \frac{11}{12}$$



$$\frac{3}{12} + \frac{8}{12} = \frac{11}{12}$$

$$\frac{5}{6} - \frac{1}{4} =$$

$$\frac{10}{12} - \frac{3}{12} = \frac{7}{12}$$

Dividing fractions

Dividing can be thought of as grouping (if **numerator** divisible by **integer**) or splitting.

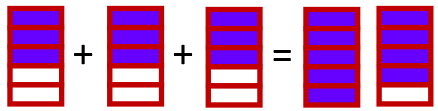
$$\frac{6}{7} \div 3 = \frac{2}{7} \qquad (6 \xrightarrow{\div 3} 2)$$

$$\frac{2}{3} \div 3 = \frac{2}{9} \qquad (3 \xrightarrow{\times 3} 9)$$

Multiplying fractions

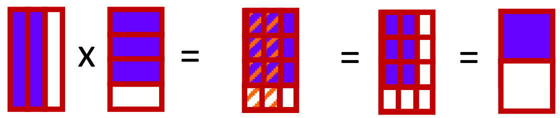
If multiplying by an **integer**, think of it as repeated addition.

$$\frac{3}{5} \times 3 = \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{9}{5} = 1\frac{4}{5}$$



If multiplying fractions together, you multiply the **numerators** together and multiply the **denominators** together.

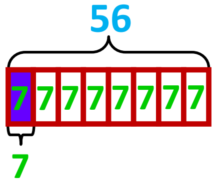
$$\frac{2}{3} \times \frac{3}{4} = \frac{2 \times 3}{3 \times 4} = \frac{6}{12} = \frac{1}{2}$$



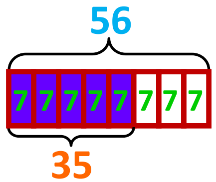
Find fractions of amounts

When finding fractions of amounts, remember the **denominator** is how many equal parts something has been split into and the **numerator** is how many parts you have

$\frac{1}{8}$ of $56 = 56 \div 8 = 7$



$\frac{5}{8}$ of $56 = (56 \div 8) \times 5 = 7 \times 5 = 35$



Extra note: multiplication will result in the exact same thing!!

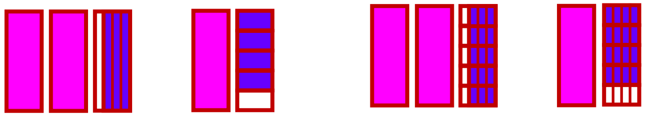
$$\frac{5}{8} \times 56 = \frac{5 \times 56}{8} = \frac{280}{8} = 35$$

@MrH_T77

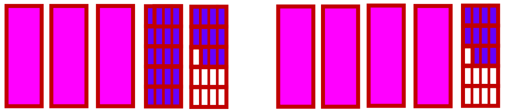
Year 5/6 - Fractions (2)

Adding mixed numbers

$$2\frac{3}{4} + 1\frac{4}{5} = 2\frac{15}{20} + 1\frac{16}{20}$$



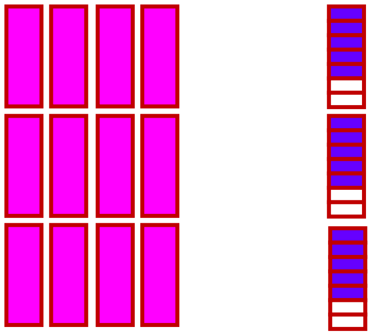
$$= 3\frac{31}{20} = 4\frac{11}{20}$$



Multiplying mixed number

Remember to multiply the **integer** and the **fraction**.

$$4\frac{5}{7} \times 3 = 4 \times 3 + \frac{5}{7} \times 3$$



$$4\frac{5}{7} \times 3 = 12 + \frac{15}{7}$$

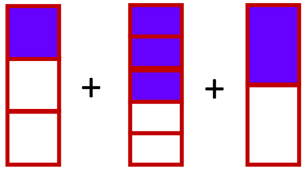
$$4\frac{5}{7} \times 3 = 12 + 2\frac{1}{7}$$

$$4\frac{5}{7} \times 3 = 14\frac{1}{7}$$

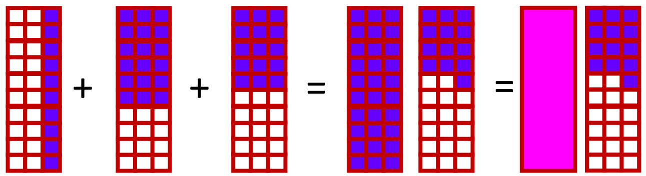
Adding three fractions

Convert them all into like fractions

$$\frac{1}{3} + \frac{3}{5} + \frac{1}{2}$$

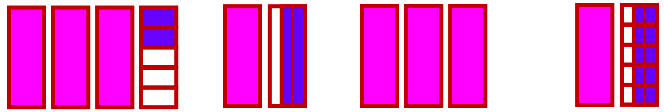


$$\frac{10}{30} + \frac{18}{30} + \frac{15}{30} = \frac{43}{30} = 1\frac{13}{30}$$

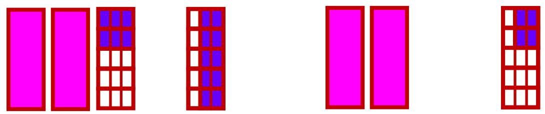


Subtracting mixed numbers

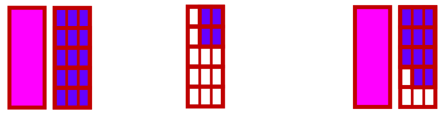
$$3\frac{2}{5} - 1\frac{2}{3} = 3\frac{6}{15} - 1\frac{10}{15}$$



$$= 2\frac{6}{15} - \frac{10}{15} = 2 - \frac{4}{15}$$



$$= 1\frac{15}{15} - \frac{4}{15} = 1\frac{11}{15}$$

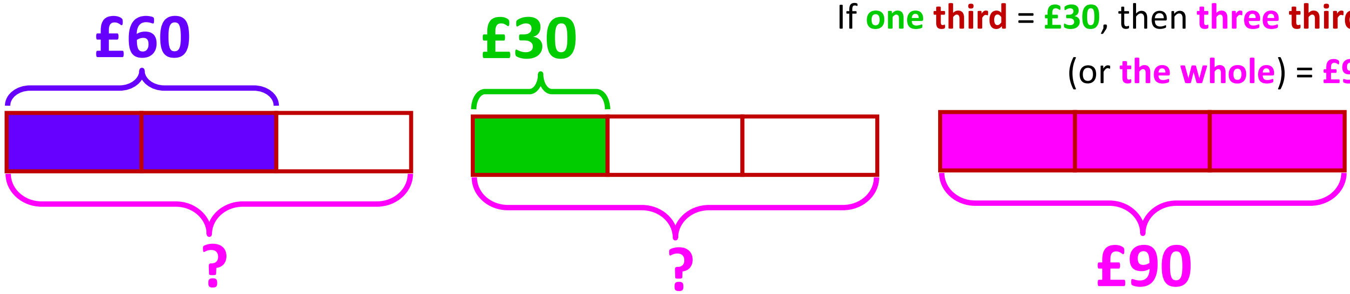


Finding Wholes

Sam spent two thirds of his money. If he'd spent £60, how much did he start off with?

If two thirds = £60, then one third = £30.

If one third = £30, then three thirds (or the whole) = £90



@MrH_T77

Year 5/6 - Decimals and Percentages

Decimal place value

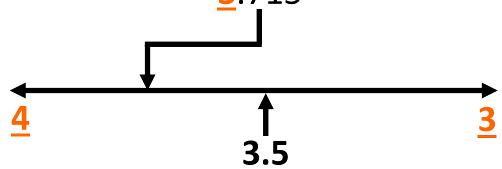
Ones (1s) 1	Tenths (0.1s) $\frac{1}{10}$	Hundredths (0.01s) $\frac{1}{100}$	Thousandths (0.001s) $\frac{1}{1000}$
1 1 1 1 1	0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01	0.001 0.001 0.001 0.001
5	2	6	4

5.264 = 5+0.2+0.06+0.004

Rounding decimals

e.g. Rounded to the nearest whole number

3.715



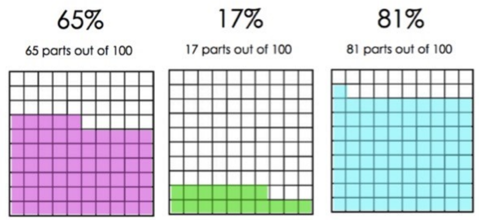
3.715 $\xrightarrow{\text{Nearest 1}}$ 4

3.715 $\xrightarrow{\text{Nearest 0.1}}$ 3.7

3.715 $\xrightarrow{\text{Nearest 0.01}}$ 3.72

Percentages

Percent means **per 100** or **/100**



$\frac{65}{100}$ $\frac{17}{100}$ $\frac{81}{100}$

Percentages of amounts

50% = $\frac{1}{2}$ = ÷2 10% = $\frac{1}{10}$ = ÷10

25% = $\frac{1}{4}$ = ÷4 1% = $\frac{1}{100}$ = ÷100

Using these rules we can make any percentage, e.g.

5% = 10% ÷ 2 or 1% x 5

40% = 10% x 4 or 50% - 10% - 10%

35% of 240 = 72 + 12 = 84

10% of 240 = 24

30% of 240 = 72 (x3) (÷2) 5% of 240 = 12

An easier way? (Particularly for tricky percentages)

We know percentages are easy to turn to /100

35% of 240 =35/100 of 240

240 x 35 = 8,400 8,400 ÷ 100 = 84

35% of 240 = 84

Ordering decimals

START with the digits with the most value.

5.53 < 6.09

If the digits are the same move to the next.

7.781 > 7.769

Remember to check the column value

3.7 > 3.302

Multiplying Decimals

$$\begin{array}{r} £5.53 \\ \times\ 6 \\ \hline £33.18 \end{array}$$

3 1

Decimal point stays where it is

Dividing Decimals

$$\begin{array}{r} £0.63 \\ 6\overline{)£3.78} \end{array}$$

Decimal point stays where it is

Decimals and fractions

$\frac{1}{10}$ = 0.1 $\frac{1}{100}$ = 0.01 $\frac{1}{1000}$ = 0.001

0.35 = $\frac{3}{10}$ + $\frac{5}{100}$ = $\frac{35}{100}$

0.741 = $\frac{7}{10}$ + $\frac{4}{100}$ + $\frac{1}{1000}$ = $\frac{741}{1000}$

$\frac{100}{100}$ = 100% $\frac{1}{100}$ = 1% $\frac{37}{100}$ = 37%

Common fraction, decimal, % equivalencies

$\frac{1}{10}$ = 0.1 = 10% $\frac{3}{4}$ = 0.75 = 75%

$\frac{1}{2}$ = 0.5 = 50% $\frac{1}{5}$ = 0.2 = 20%

$\frac{1}{4}$ = 0.25 = 25% $\frac{1}{8}$ = 0.125 = 12.5%

Year 5/6 - Algebra

Finding an algebraic rule

input → function(s) → output

a → +5 → a+5

y → x5 → yx5 or 5y

n → x3 → -7 → 3n-7

n → -7 → x3 → 3(n-7)

Using an algebraic rule

b+12

if b=7, b+12=19

if b=3, b+12=15

n+m

if n=7 and m=3, n+m=10

if n=9 and m=-7, n+m=2

3t+8

if t=3, 3t+8=3x3+8=17

if t=7, 3t+8=3x7+8=28

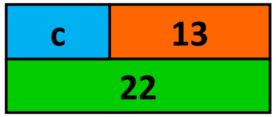
Finding possible values

a + b = 6	3c - 7 = y
a = 4, b = 2	c = 4, y = 5
a = 3, b = 3	c = 2, y = -1
a = 1, b = 5	c = 10, y = 23
a = -3, b = 9	c = 100, y = 293

Solving equations

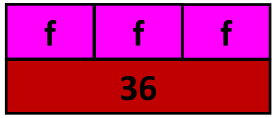
c + 13 = 22

c = 22 - 13 = 9



3f = 36

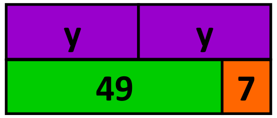
f = 36 ÷ 3 = 12



2y - 7 = 49

2y = 49 + 7 = 56

y = 28



Using a formula

Algebraic formulae are rules which describe a mathematical relationship - e.g.

The formula for the area of a triangle

Area = b x h ÷ 2

The total cost of a taxi journey (C) is **£1.50** and **30p** for **the number of miles travelled (m).**

C = £1.50 + £0.30 x m

Algebra and word problems

Word problems can be shown algebraically.

I think of **a number** → x

I **multiply it by 6** → $6x$

I then **add 4** → $6x+4$

My new number is **34** → $6x+4=34$

$6x+4=34 \rightarrow 6x=30 \rightarrow x=5$

Alice, **Sophie** and **Matt** are siblings. **Alice** is **twice as old** as **Matt**. **Sophie** is **7 years** older than **Matt**. If **Sophie** is **12**, how old is **Alice**?

A = 2M

M = S - 7

If S = 12, M = 5 and

A = 2 x 5 = 10

Lenny and **Carl** have **£120** between them. **Lenny** has **three times as much** as **Carl**. How much do they have each?

L + C = £120

L = 3C

3C + C = £120 = 4C

Carl = £30

Lenny = £30 x 3 = £90

@MrH_T77

@MrH_T77

Year 5/6 - Ratio

Language of Ratio

A ratio shows the relationship between values.

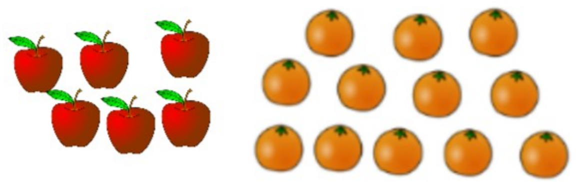
For every 2 **blue flowers** there are 4 **pink flowers**. The ratio of **blue flowers** to **pink flowers** is **2**:**4**.

OR

For every **blue flower** there are 2 **pink flowers**. The ratio of **blue flowers** to **pink flowers** is **1**:**2**.

Ratios and fractions

Ratios and fractions are very closely linked.



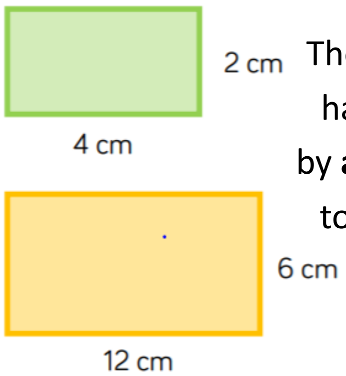
The ratio of **apples** to **oranges** is **6**:**12** or **1**:**2**. There are **1**/**2 the number of apples** compared to **oranges** **OR** there are **twice** as many **oranges** as **apples**.

The ratio of **apples** to **the total number of fruit** is **6**:**18** or **1**:**3**.

1/**3** of **all the fruit** are **apples**.

Scale factors

When a shape is increased by a scale factor, the length and width are multiplied by the scale factor.



The **green rectangle** has been increased by **a scale factor of 3** to make the **yellow rectangle**.

Flapjacks
Serves: 10
120 g butter
100 g dark brown soft sugar
4 tablespoons golden syrup
250 g rolled oats
40 g sultanas or raisins

John has 180g of butter. What is the largest number of flapjacks he can make?

120g of → **Serves 10**

180g of → **Serves 15**

120 : **180**
÷60
2 : **3**
x5
10 : **15**

Calculating ratios

A farmer plants some crops in a field. For every **12 carrots**, she plants **5 potatoes**. She plants **60 carrots** in total. How many **potatoes** did she plant? How many **vegetables** did she plant in total?

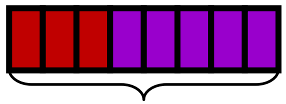
Carrots:Potatoes → **12** : **5**

x5

60 Carrots → **60** : **25**

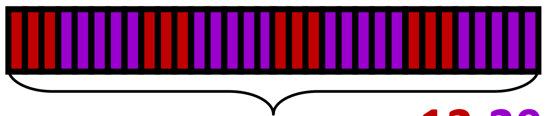
85 Vegetables ← **25 Potatoes**

Emily has a packet of sweets. For every **3 red sweets** there are **5 purple sweets.** If there are **32 sweets in the packet in total**, how many of each colour are there?



3:**5**

8



32

12 red and 20purple

12:**20**

If you had **3 red sweets**, you'd have **5 purple** - so **8 sweets in total**. **8** goes into **32 4 times** - so you'd have **3**x**4 red sweets** and **5**x**4 purple**.

Year 5/6 - Converting Units

@MrH_T77

Metric vs Imperial

Volume	Distance	Mass
millilitres (ml) centilitres (cl) litres (l)	millimetres (mm) centimetres (cm) metres (m) kilometres (km)	milligrams (mg) grams (g) kilograms (kg)
Pints (pt) gallons (gal)	inches (in) feet (ft) yards (yd)	ounces (oz) pounds (lb) stone (st)

Time Conversion

seconds
minutes
hours
days
weeks
months
years

60 seconds = 1 minute

60 minutes = 1 hour

24 hours = 1 day

7 days = 1 week

28/29/30/31 days = 1 month

~365 days = 1 year

~52 weeks = 1 year

12 months = 1 year

Miles to Kilometres

5 miles ≈ 8 kilometres

e.g.

45 miles = 9 x 5 miles

9 x 8 kilometres = 72 kilometres

45 miles ≈ 72 kilometres

Calculating with measures

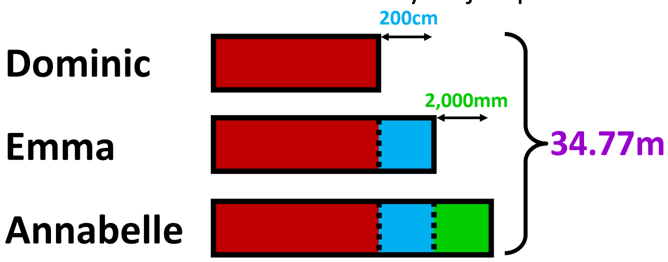
A parcel weighs 439 grams. How many kilograms would 27 parcels weigh?

439g x 27 = 11,853g = 11.853kg

Dominic, **Emma** and **Annabelle** jumped a total of 34.77m in a long jump competition.

Emma jumped exactly 200cm further than **Dominic**. **Annabelle** jumped exactly 2,000mm further than **Emma**.

What distance did they all jump?



2,000mm = 200cm 34.77m = 3,477cm

3,477cm - 200cm - 200cm - 200cm = 2,877cm

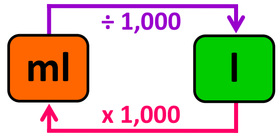
2,877cm ÷ 3 = 959cm = Dominic

959cm + 200cm = 1,159cm = Emma

1,159cm + 200cm = 1,359cm = Annabelle

Converting metric units

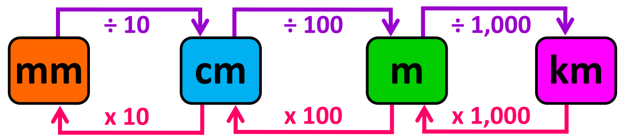
Volume



1l = 1,000ml

e.g. 3,500ml = 3.5l

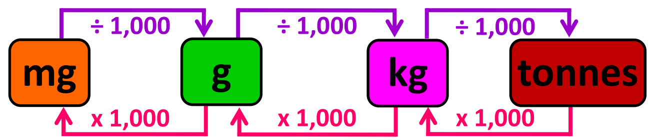
Distance



1cm = 10mm; 1m = 100cm; 1km = 1,000m

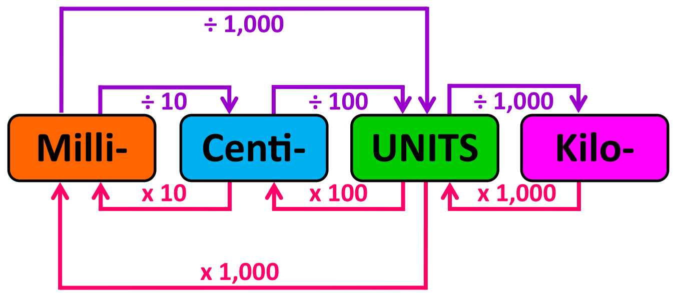
e.g. 653cm = 6.53m

Mass



1g = 1,000mg; 1kg = 1,000g; 1tonne = 1,000kg

All metric units follow the pattern below; however, not all terms are regularly used (e.g. we don't regularly use cg or kl)

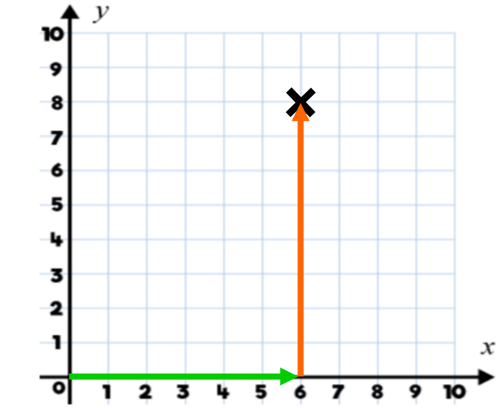


@MrH_T77

Year 5/6 - Position and direction

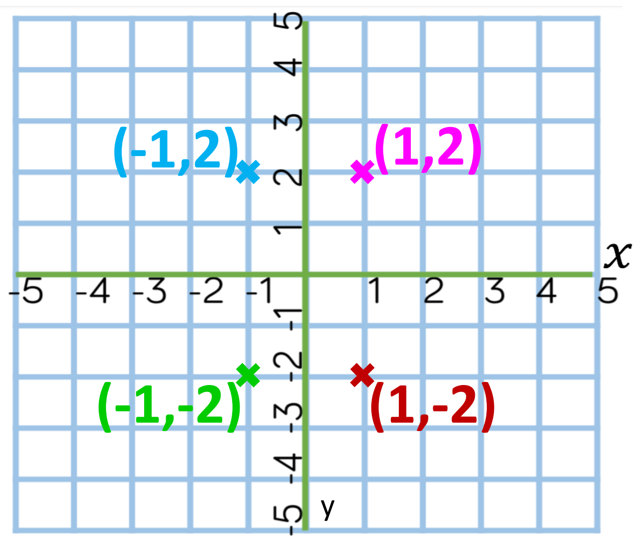
Plotting in the first quadrant

(6,8)



When plotting co-ordinates, the **first co-ordinate** represents moving in the **x-direction** and the **second co-ordinate** represents moving in the **y-direction**.

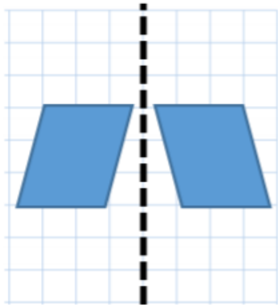
All four quadrants

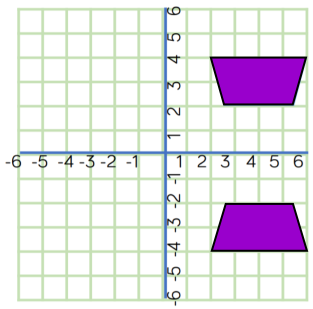


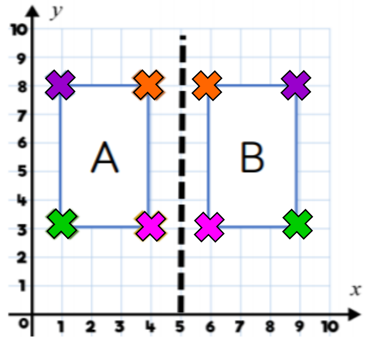
With four quadrants, co-ordinates can be in a positive and negative direction

Reflections

Reflections are where a shape or co-ordinates are mirrored across a line.





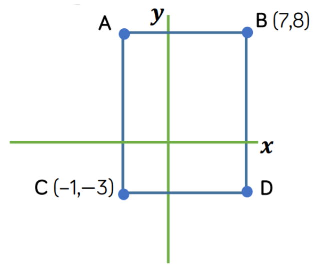


As you can see in the above example, the co-ordinates closest to the line of reflection in shape A are still the closest after being reflected.

(4,3) ⟶ (6,3) / (4,8) ⟶ (6,8)

(1,3) ⟶ (9,3) / (1,8) ⟶ (9,8)

Properties of shapes



A will have the same x co-ordinate as **C.**

A will have the same y co-ordinate as **B.**

D will have the same x co-ordinate as **B.**

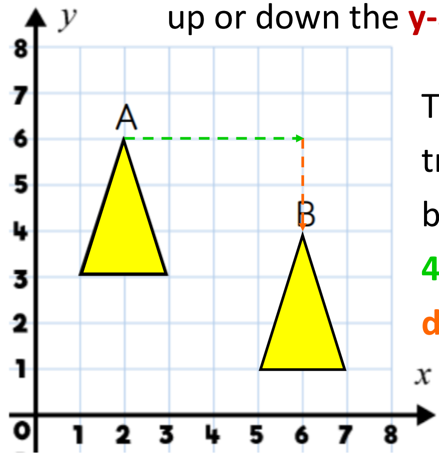
D will have the same y co-ordinate as **C.**

B = (7,8)
C = (-1,-3)
A = (-1,8)

B = (7,8)
C = (-1,-3)
D = (7,-3)

Translation

Translations are where a shape or co-ordinates are move across the **x-axis** and up or down the **y-axis**.



The yellow triangle has been translated **4 right** and **2 down**.

Vertex A = (2,6)

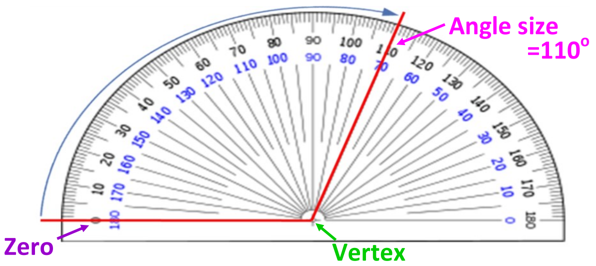
Vertex B = (6,4)

The **x co-ordinate** has **increased by 4** and the **y co-ordinate** has **decreased by 2**.

@MrH_T77

Year 5/6 - Properties of shapes: Angles

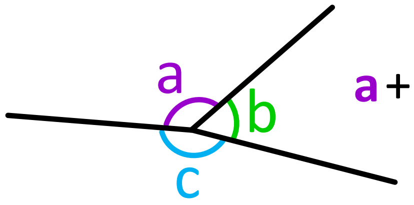
Measuring angles



When measuring angles, place the centre of the protractor on the **vertex** - with **one line meeting a zero**. **Follow around** from the **0** until you reach **the next line** to read the angle.

Angles on a straight line

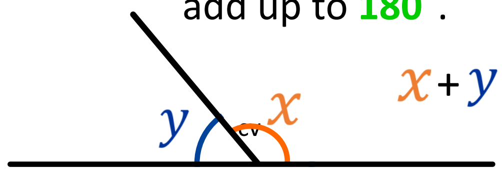
All the angles around a point will add up to **360°**.



$a + b + c = 360°$

Angles on a straight line

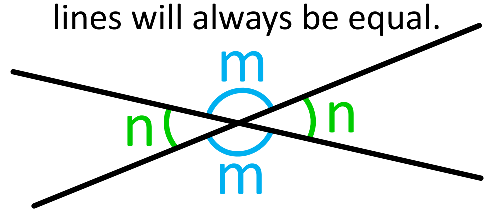
All the angles along a straight line will add up to **180°**.



$x + y = 180°$

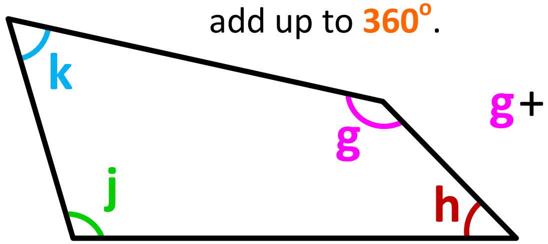
Vertically opposite angles

Opposite angles of two straight intersecting lines will always be equal.



Angles in quadrilaterals

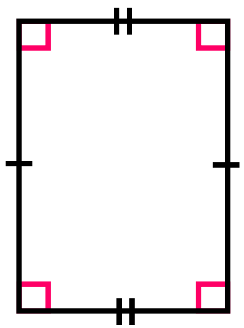
The interior angles in a quadrilateral always add up to **360°**.



$g + h + j + k = 360°$

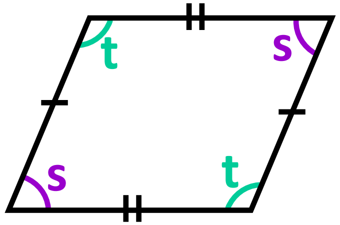
Rectangles

(including squares) have **four 90° angles**.



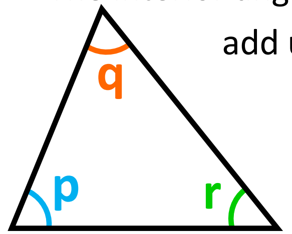
Parallelograms

(including rectangles and rhombuses) the **opposite angles are equal**.



Angles in a triangle

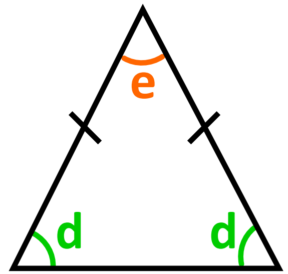
The interior angles in a triangle always add up to **180°**.



$p + q + r = 180°$

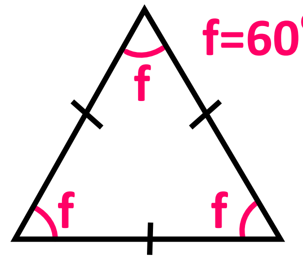
Isosceles triangle

Has two sides of equal length and **two equal angles**.



Equilateral triangle

Has three sides of equal length and **three equal angles**.



$f = 60°$

Regular shapes

Regular shapes have sides with the same lengths and all equal angles.

Interestingly, for each extra side on a polygon, the sum of the angles is 180° more.

Shape (no. of sides)	Sum of angles	Single angle in regular shape
Triangle (3)	180°	180° ÷ 3 = 60°
Quadrilateral (4)	360°	360° ÷ 4 = 90°
Pentagon (5)	540°	540° ÷ 5 = 108°
Hexagon (6)	720°	720° ÷ 6 = 120°

@MrH_T77

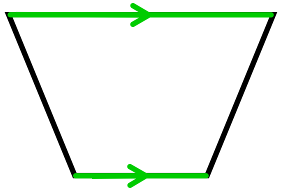
Year 5/6 - 2D and 3D shapes

Quadrilaterals

Any **4-sided polygon** is called a quadrilateral.

Trapezium

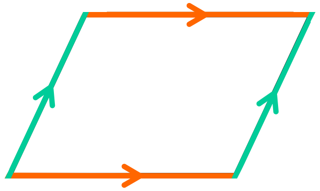
- at least one pair of parallel lines



Parallelogram

A type of trapezium

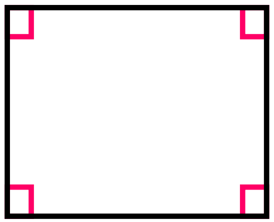
- opposite sides are parallel and equal



Rectangle

A type of parallelogram

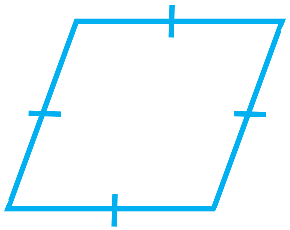
- all four interior angles are 90°



Rhombus

A type of parallelogram

- all four sides are equal in length

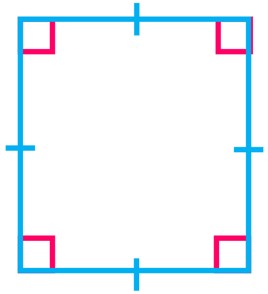


Square

A regular quadrilateral

A type of rectangle and rhombus

- opposite sides are equal in length
- four 90° angles



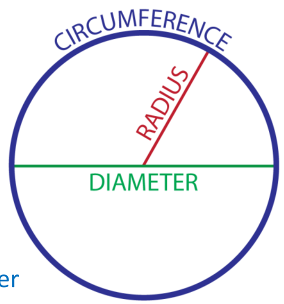
Shape Vocabulary

Term	Definition
Corner	The point where 2 line meet
Side	The lines forming the outside of a 2D shape
Vertex (*pl.* Vertices)	The point where 2 (or more) lines meet
Face	The flat 2D surfaces of a 3D shape
Edge	The part where 2 faces in a 3D shape meet
Parallel	Describes two lines which will never meet

Circles

Radius - the distance from the centre of a circle to the outside

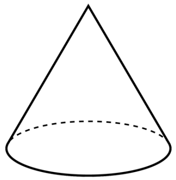
Diameter - the distance from one side of a circle to the other (passing through the centre)



Circumference - a circle's perimeter

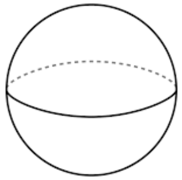
Cone

a cone has a circular base which joins at an apex



Sphere

a sphere is a perfectly round 3D shape



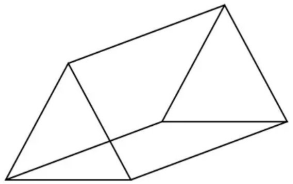
3D Shapes

Prisms

has 2 faces of a **given polygon** - which are connected by rectangular faces

e.g.

A **triangular** prism:

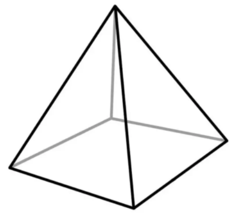


Pyramids

has **a base of a given polygon** - which joins at a vertex.

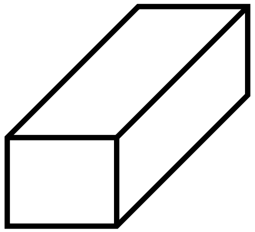
e.g.

A **square-based** pyramid:



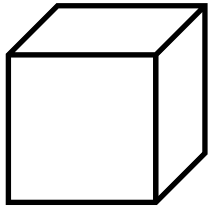
Cuboid

a cuboid is a rectangular prism



Cube

a cube is a cuboid - where all 6 faces are square



Cylinder

a cylinder has 2 circular faces connected by a curved surface