



## long multiplication

		4	3	5	7	
	x			3	6	
		2	6	1	4	2
1	3	0	7	1	0	(4357 x 30)
1	5	6	8	5	2	

## short division

		0	5	2	r3	decimal
1	2	6	2	7		52.25
		1				fraction
						$52\frac{3}{12} / 52\frac{1}{4}$

**Common factors** of 12 and 30 are **1, 2, 3** and **6**.

The **highest common factor (HCF)** is **6**

$\frac{12}{1 \times 12}$	$\frac{30}{1 \times 30}$
$\frac{12}{2 \times 6}$	$\frac{30}{2 \times 15}$
$\frac{12}{3 \times 4}$	$\frac{30}{3 \times 10}$
	$\frac{30}{5 \times 6}$

**Common multiples** of 3 and 4 include **12** and **24**. The **lowest common multiple (LCM)** is **12**

Multiples of 3: 3, 6, 9, **12**, 15, 18, 21, **24**, 27  
 Multiples of 4: 4, 8, **12**, 16, 20, **24**, 28, 32

## using rounding to estimate

**3.8 x 6**

3.8 is roughly equal to 4.  
 $4 \times 6 = 24$

## long division

		0	5	2	r3	
1	2	6	2	7		(12 x 50)
	-	6	0	0		
			2	7		(12 x 2)
	-		2	4		
				3		

A prime number is a whole number greater than one that only has two factors- one and itself. It can't be divided by another positive integer without leaving a remainder. 2 is the only even prime number

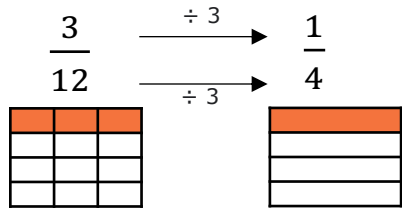
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- B** Brackets
- O** Order (square/ cubes/ roots)
- DM** Division and multiplication
- AS** Addition and subtraction

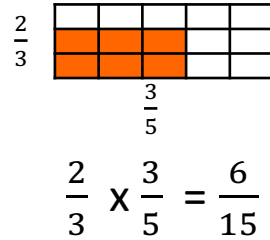
$5 - 3 + (6 \times 2) \times 2^2$   
 $5 - 3 + 12 \times 2^2$  1) Solve any brackets ( $6 \times 2 = 12$ )  
 $5 - 3 + 12 \times 4$  2) Solve any square/ cube/ roots ( $2^2 = 4$ )  
 $5 - 3 + 48$  3) Solve any division or multiplication in order from left to right ( $12 \times 4 = 48$ )  
**50** 4) Solve any addition or subtraction in order from left to right ( $5 - 3 + 48 = 50$ )

# Y6- Fractions (including Decimal and Percentages)

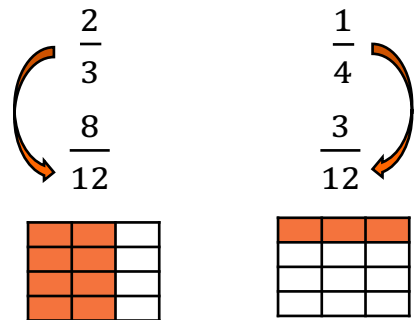
## simplifying fractions



## multiplying pairs of fractions



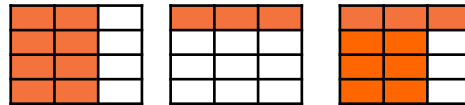
## expressing fractions in the same denominator



## adding fractions with different denominators

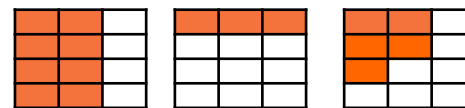
First express the fractions as the same denominator

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



## subtracting fractions with different denominators

$$\frac{8}{12} - \frac{3}{12} = \frac{5}{12}$$



## comparing fractions

$$\frac{8}{12} > \frac{3}{12}$$



0	t	h	th
3	5	7	2

1			
0	5		
0	0	7	
0	0	0	2

## multiplying by 10, 100 and 1000

M	HTh	TTh	Th	H	T	O	t	h	th
					1	2	4	5	
				1	2	4	5		
			1	2	4	5			
		1	2	4	5	0			

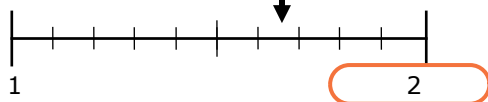
## dividing by 10, 100 and 1000

M	HTh	TTh	Th	H	T	O	t	h	th
				4	2	1			
					4	2	1		
						4	2	1	
						0	4	2	1

# Y6- Fractions (including Decimal and Percentages)

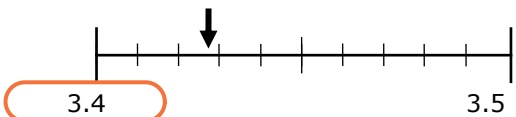
Round to the nearest whole number

**1.673**



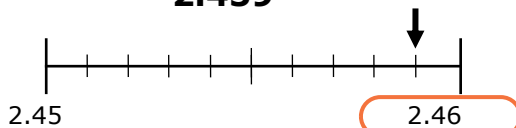
Round to the nearest tenth

**3.429**



Round to the nearest hundredth

**2.459**



$$12.4 \times 8$$

		1	2	4
				8
		9	9	2
		1	3	

- 1)  $124 \times 8 = 992$
- 2)  $12.4 \times 8 = 99.2$

Estimate the answer to make sure it's reasonable. E.g.  $12 \times 8 = 96$ , so the answer should be approximately 96

$\frac{1}{4}$  of a piece of string is 12 cm. How long is the total piece?

find the whole from a fraction

12	12	12	12
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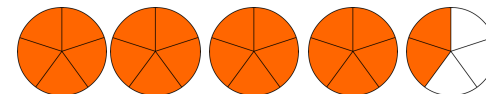
$$12 \times 4 = 48 \text{ cm}$$

associate a fraction with division

$$\frac{1}{8} = 1 \div 8$$

	0	1	2	5
8	1	0	0	0
	1	2	4	

mixed numbers and improper fractions



mixed number

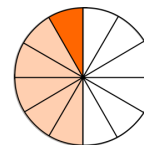
$$4\frac{2}{5}$$

improper fraction

$$\frac{22}{5}$$

dividing a fraction by a whole number

$$\frac{1}{2} \div 6 = \frac{1}{12}$$



$\frac{1}{8}$	0.125	12.5%
$\frac{1}{4}$	0.25	25%
$\frac{3}{8}$	0.375	37.5%
$\frac{1}{2}$	0.5	50%
$\frac{5}{8}$	0.625	62.5%
$\frac{3}{4}$	0.75	75%
$\frac{7}{8}$	0.875	87.5%
$\frac{8}{8}$	1	100%

## calculating percentages of a number

'per cent' means 'out of 100'.  
50% means  $\frac{50}{100}$  (50 out of 100)

### Key percentages to remember

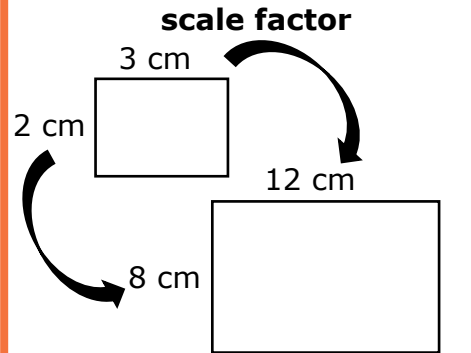
50%	divide the number by 2
25%	divide the number by 4
75%	divide the number by 4, then multiply the answer by 3
10%	divide the number by 10
1%	divide the number by 100

### Multiples of 10%

30%	Divide the number by 10, then multiply the answer by 3
40%	Divide the number by 10, then multiply the answer by 4
70%	Divide the number by 10, then multiply the answer by 7

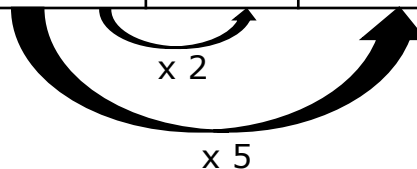
### Other percentages

32%	Divide the number by 100, then multiply the answer by 32
78%	Divide the number by 100, then multiply the answer by 78



**enlarged by a scale factor of 4**

1 cake	2 cakes	5 cakes
2 eggs	4 eggs	10 eggs
100 g flour	200g flour	500g flour
50 ml milk	100 ml milk	250 ml milk



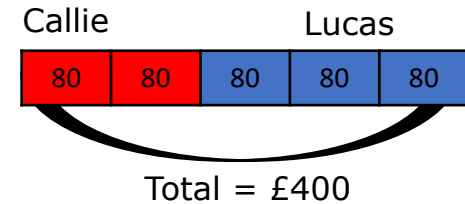
## ratio



The ratio of red blocks to blue blocks is **2:4** (simplified to **1:2**)

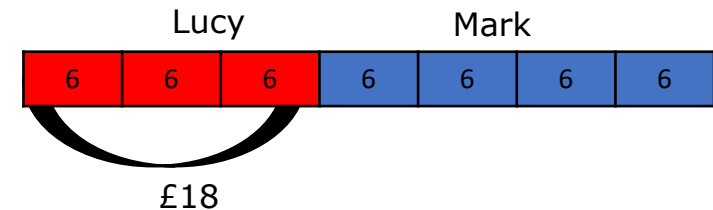
### Both parts are known

A prize of £400 is shared in a ratio of 2:3 between Callie and Lucas. How much do they get each?



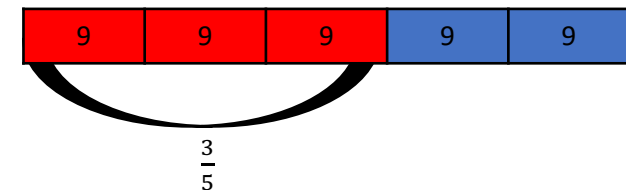
### One part is known

A prize is shared in a ratio of 3:4 between Lucy and Mark. If Lucy gets £18, how much should Mark get?



### using fractions

Mia has a bag of 45 marbles.  $\frac{3}{5}$  are red and the rest are blue. How many are blue?



**using simple formulae**

$$3x + 4 = 22$$

$$3x = 18$$

$$x = 6$$

x	x	x	4
22			

**find pairs of numbers that satisfy an equation**

$$2a + b = 12$$

- $2 \times 1 + 10 = 12$
- $2 \times 2 + 8 = 12$
- $2 \times 3 + 6 = 12$
- $2 \times 4 + 4 = 12$
- $2 \times 5 + 2 = 12$

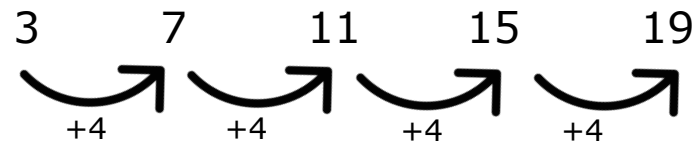
**using algebra to show unknown measurements**

A piece of string was 130 cm long but a section was cut off. The string is now 103 cm long. How much was cut off?

$$130 - x = 103$$

$$130 - 27 = 103$$

**describe linear number sequences**



Find the difference between each term in the sequence. This is your 'n'

$$4n$$

Work out how to get from your 'n' to the first term in the sequence. In this case, -1.

$$4n - 1$$

Check your rule

- $4 \times 1 - 1 = 3$
- $4 \times 2 - 1 = 7$
- $4 \times 3 - 1 = 11$
- $4 \times 4 - 1 = 15$
- $4 \times 5 - 1 = 19$

**generate linear number sequences**

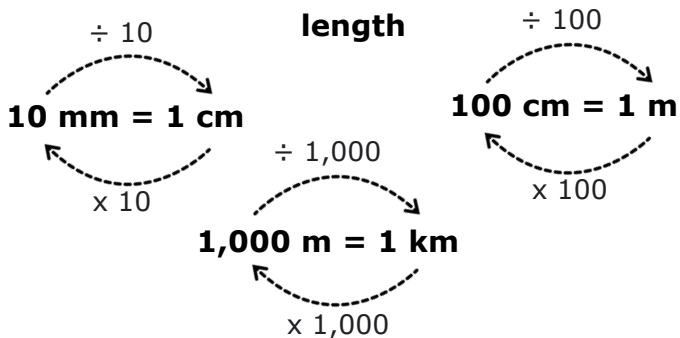
Rule:  $3n + 2$

- 1) Multiply the 'n' number by each term in the sequence
- 2) Add or subtract the number that comes after the 'n'

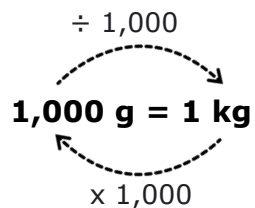
- 1<sup>st</sup> term:**  $3 \times 1 + 2 = 5$
- 2<sup>nd</sup> term:**  $3 \times 2 + 2 = 7$
- 20<sup>th</sup> term:**  $3 \times 20 + 2 = 62$
- 100<sup>th</sup> term:**  $3 \times 100 + 2 = 302$

## metric units of measure

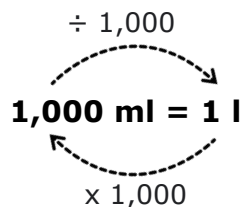
### length



### mass

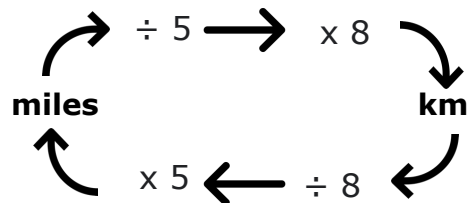


### capacity



## convert between miles and kilometres

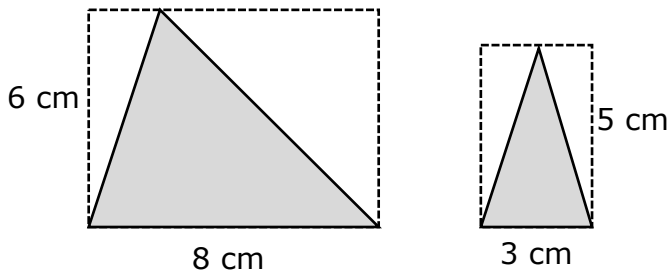
$1 \text{ mile} \approx 1.6 \text{ km}$   
 $5 \text{ miles} \approx 8 \text{ km}$



$25 \text{ miles} \approx 40 \text{ km}$   
 $32 \text{ km} \approx 20 \text{ miles}$

## area of triangles

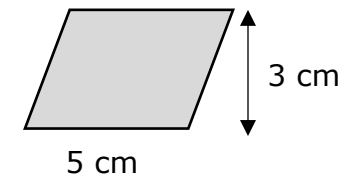
$$(b \times h) \div 2$$



$$(8 \times 6) \div 2 = 24 \text{ cm}^2 \quad (3 \times 5) \div 2 = 7.5 \text{ cm}^2$$

## area of parallelograms

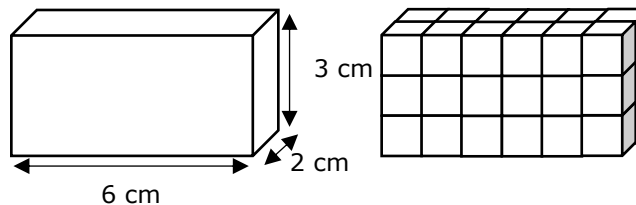
$$(b \times h)$$



$$3 \times 5 = 15 \text{ cm}^2$$

## volume of cuboids

$$\text{width} \times \text{length} \times \text{height}$$

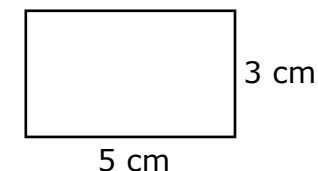


$$6 \times 2 \times 3 = 36 \text{ cm}^3$$

## area and perimeter of rectangles

$$\text{Area} = \text{length} \times \text{width}$$

$$\text{Perimeter} = 2L + 2W$$



$$\text{Area} = 5 \times 3 = 15 \text{ cm}^2$$

$$\text{Perimeter} = (5 \times 2) + (3 \times 2) = 16 \text{ cm}^2$$

## convert units of time

60 seconds = 1 minute

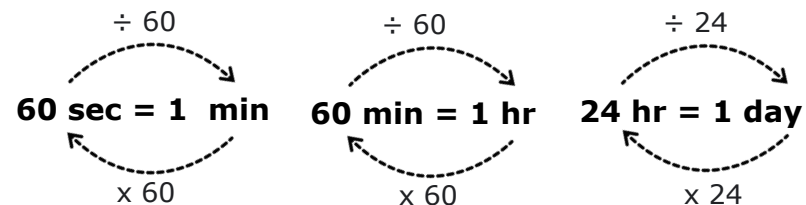
60 minutes = 1 hour

24 hours = 1 day

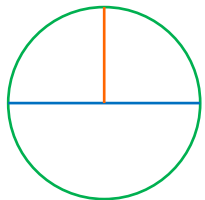
7 days = 1 week

12 months = 1 year

365 days = 1 year



## parts of circle



**circumference**- the distance around the edge of the circle

**radius**- the distance from the centre of the circle to the outer edge

**diameter**- the distance from one edge of the circle to another through the centre

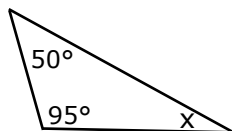
The radius of a circle is half the diameter.

## angles in polygons

The sum of the angles in a polygon is equal to the number of sides, subtract two then multiplied by  $180^\circ$

triangle:  $180^\circ$   
 quadrilateral:  $360^\circ$   
 pentagon:  $540^\circ$   
 triangle:  $720^\circ$

## angles in triangle



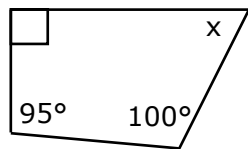
Angles in a triangle add up to  $180^\circ$

$$95^\circ + 50^\circ + x = 180^\circ$$

$$145^\circ + x = 180^\circ$$

$$x = 35^\circ$$

## angles in a quadrilateral



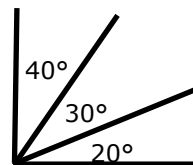
Angles in a quadrilateral add up to  $360^\circ$

$$90^\circ + 95^\circ + 100^\circ + x = 360^\circ$$

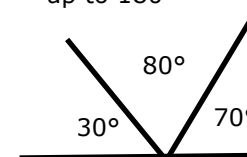
$$285^\circ + x = 360^\circ$$

$$x = 75^\circ$$

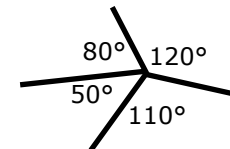
Angles in a right angle add up to  $90^\circ$



Angles in a straight line add up to  $180^\circ$

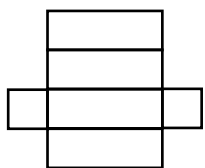


Angles around a point add up to  $360^\circ$

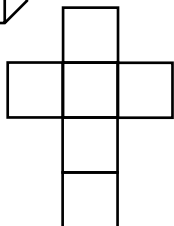


## 3D shapes and their nets

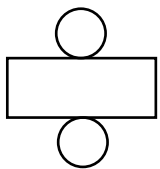
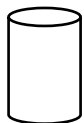
### cuboid



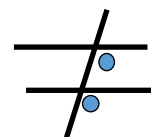
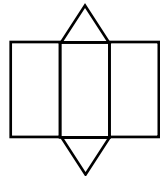
### cube



### cylinder

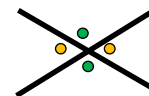
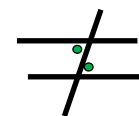


### triangular prism

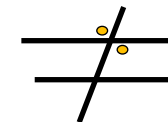


corresponding angles are equal

alternate angles are equal



opposite angles are equal



### cube

6 square faces  
 12 edges  
 8 vertices

### cuboid

6 faces  
 12 edges  
 8 vertices

### sphere

1 curved surface  
 0 edges  
 0 vertices

### tetrahedron

4 triangular faces  
 6 edges  
 4 vertices

### triangular prism

5 faces  
 9 edges  
 6 vertices

### cylinder

2 circular faces  
 1 curved surface  
 2 curved edges  
 0 vertices

### cone

1 circular face  
 1 curved surface  
 1 curved edge  
 1 apex

### square-based pyramid

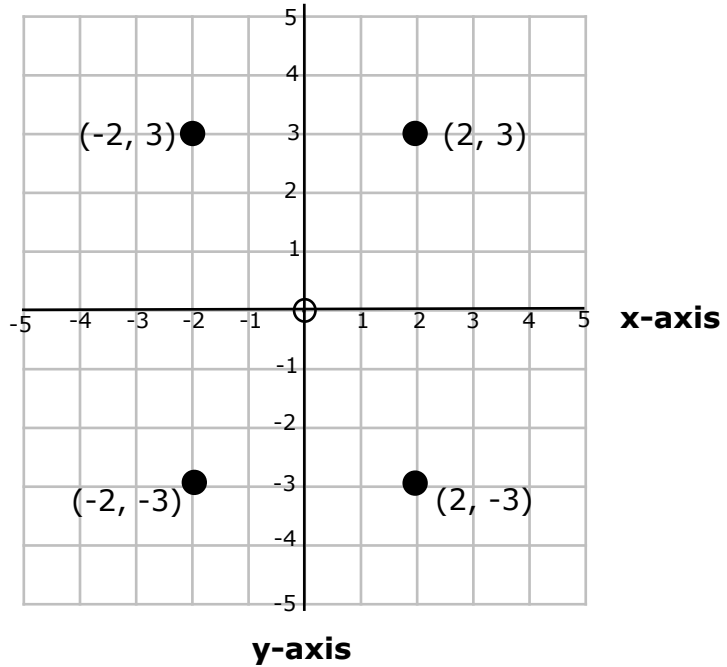
5 faces  
 8 edges  
 5 vertices

### octahedron

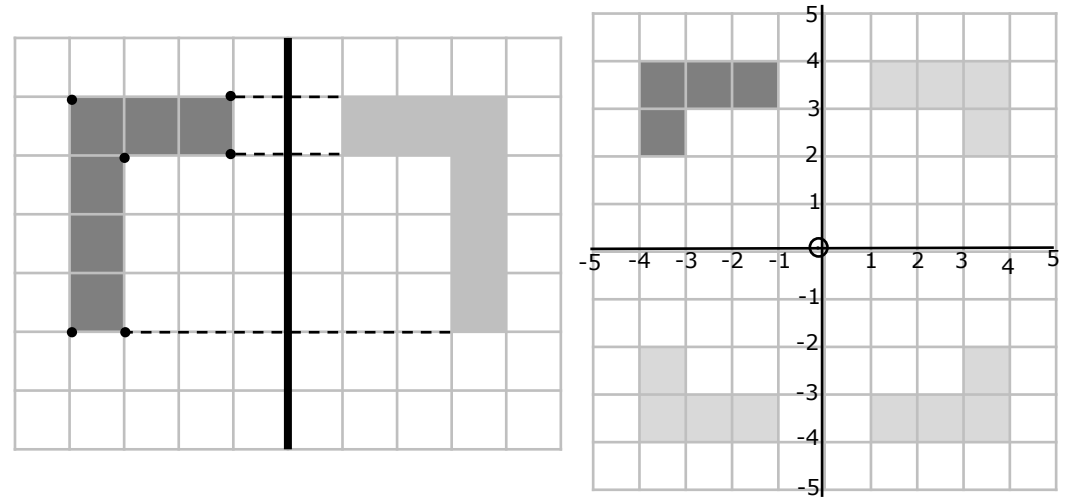
8 faces  
 12 edges  
 6 vertices



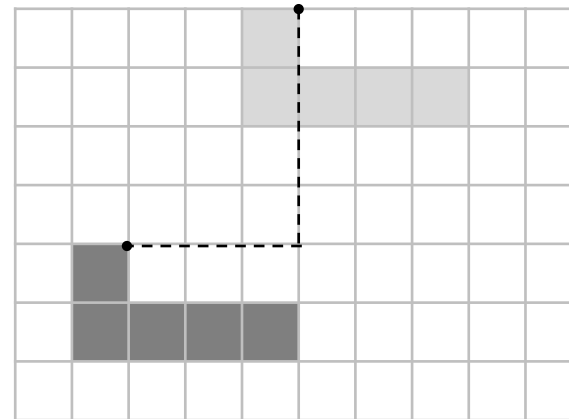
## coordinates



## reflection



## translation

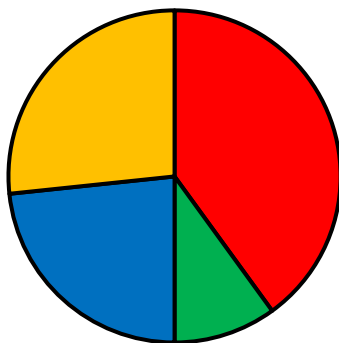


Translate the shape 3 units right and 4 units up

### pie graphs

Pie graphs are a way of showing data as a snapshot in time

Pie chart showing the favourite fruits in Year 5

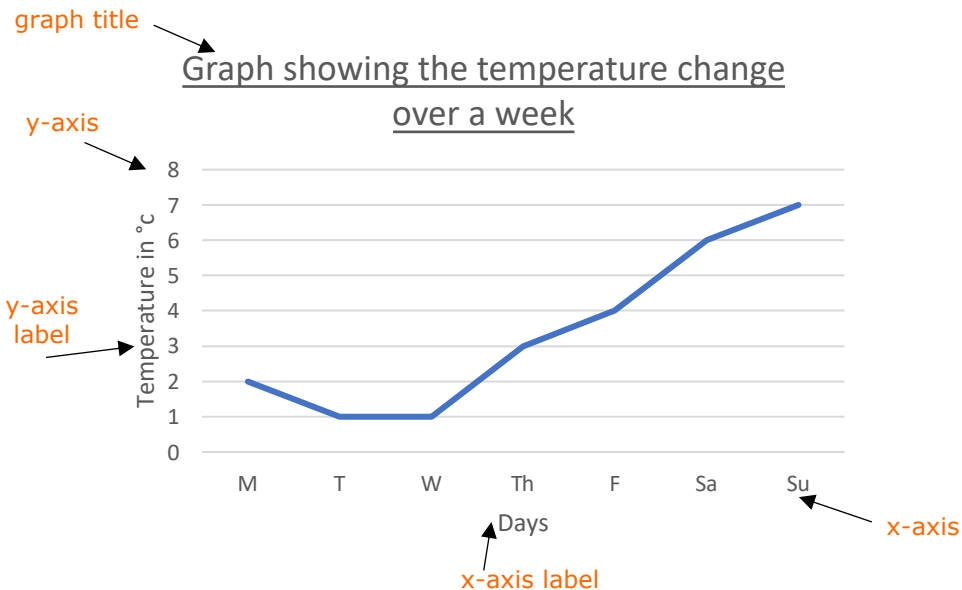


■ strawberries ■ apples ■ blueberries ■ bananas

strawberries	12	$\frac{12}{30} = \frac{144}{360} = 144^\circ$
apples	3	$\frac{3}{30} = \frac{36}{360} = 36^\circ$
blueberries	7	$\frac{7}{30} = \frac{84}{360} = 84^\circ$
bananas	8	$\frac{8}{30} = \frac{96}{360} = 96^\circ$

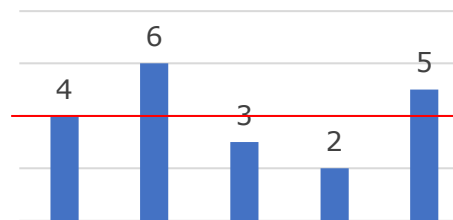
### line graphs

Line graphs show a change over time



### calculating the mean

The mean is a way of finding the average of a set of data



To find the mean, first add the values together  
(4 + 6 + 3 + 2 + 5 = 20)

Next divide the answer by the amount of values (20 ÷ 5 = 4)

The mean of this set of data is 4