Y6: PROMPT sheet

6/1 Place value in numbers to 10million

The position of the digit gives its size

Ten millions	Millions	Hundred thousands	Ten thousands	thousands	hundreds	tens	units
1	2	3	4	5	6	7	8

Example

The value of the digit '**1**' is **10** 000 000
The value of the digit '**2**' is **2** 000 000
The value of the digit '**3**' is **3**00 000
The value of the digit '**4**' is **4**0 000

6/1 Round whole numbers

Example 1– Round 3**42** 679 to the nearest 10 000
- o Step 1 – Find the 'round-off digit' - **4**
- o Step 2 – Move one digit to the right - **2**

4 or less? YES – leave 'round off digit' unchanged
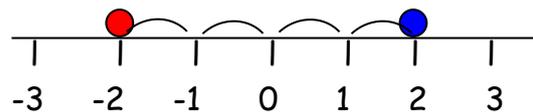 - Replace following digits with zeros

ANSWER – 3**4**0 000

Example 2– Round 3**45** 679 to the nearest 10 000
- o Step 1 – Find the 'round-off digit' - **4**
- o Step 2 – Move one digit to the right - **5**

5 or more? YES – add one to 'round off digit'
 - Replace following digits with zeros

ANSWER – 3**5**0 000

6/2 Negative numbers

$2 > -2 \longrightarrow$ We say 2 is bigger than -2

$-2 < 2 \longrightarrow$ We say -2 is less than 2

The difference between 2 and -2 = 4 (see line)

Remember the rules:
- When subtracting go down the number line
- When adding go up the number line

- 8 + - 2 is the same as 8 – 2 = 6
- 8 - + 2 is the same as 8 – 2 = 6
- 8 - - 2 is the same as 8 + 2 = 10

6/3 Multiply numbers & estimate to check

e.g. 152 x 34   **COLUMN METHOD**

```
    152
     34x
    608   (x4)
   4560   (x30)
   5168
```

6/3 Use estimates to check calculations

152 x 34
≈150 x 30
≈4500

> ≈ is the symbol for 'roughly equals'

6/3 Divide numbers & estimate to check

With a remainder also expressed as a fraction

e.g. 4928 ÷ 32   **BUS SHELTER METHOD**

```
    0 2 8              0 2 8 r 12
15)4 3 2           15)4 4₃3₁₃2
   -3 0
    1 3 2
   -1 2 0
      1 2
```

ANSWER - 432 ÷ 15 = **28 r 12**

$$= 28\frac{12}{15}$$

6/3 continued
With a remainder expressed as a decimal

```
      0 2 8 . 8            0 2 8 . 8
  15 ) 4 3 2 . 0       15 ) 4 4₃3₁₃2 .₁₂0
     -3 0 ↓
      1 3 2
     -1 2 0
        1 2
```
ANSWER - 432 ÷ 15 = **28 . 8**

6/3 Use estimates to check calculations
432 ÷ 15
≈ 450 ÷ 15
≈ 30

6/4 Factors, multiples & primes

- **FACTORS** are what divides exactly into a number

e.g. Factors of 12 are: Factors of 18 are:

1	12
2	6
3	4

1	18
2	9
3	6

The common factors of 12 & 18 are: 1, 2, 3, 6,
The Highest Common Factor is: 6

- **PRIME NUMBERS** have only TWO factors

e.g. Factors of 7 are: Factors of 13 are

1	7

1	13

So 7 and 13 are both prime numbers

- **MULTIPLES** are the times table answers

e.g. Multiples of 5 are: Multiples of 4 are:

| 5 | 10 | 15 | **20** | 25 ..... |

| 4 | 8 | 12 | 16 | **20** .... |

The Lowest Common Multiple of 5 and 4 is: **20**

6/5 Order of operations
Bracket
Indices
Divide
Multiply } Do these in the order they appear
Add
Subtract } Do these in the order they appear

e.g. 3 + 4 x 6 – 5 = 22
↑first

(2 + 1) x 3 = 9
↑
first

6/6 Addition
- **Line up the digits in the correct columns**

e.g. 48p + £2.84 + £9
```
   0 . 4 8
   2 . 8 4
   9 . 0 0+
£1 2 . 3 2
  1 1    1
```

- -

6/6 Subtraction
- **Line up the digits in the correct columns**

e.g. 645 - 427

```
      H  T  U
      6 ₃4̶ ₁5
      4  2  7  -
      2  1  8
```

6/7 Equivalent fractions

- To simplify a fraction

Example: $\dfrac{27}{36}$

First find the highest common factor of the numerator and denominator – which is 9, then divide

$$\dfrac{27}{36} = \dfrac{3}{4}$$

- To change fractions to the same denominator

Example: $\dfrac{3}{4}$ and $\dfrac{2}{3}$

Find the highest common multiple of the denominators – which is 12, then multiply:

$$\dfrac{3}{4} = \dfrac{9}{12} \text{ and } \dfrac{2}{3} = \dfrac{8}{12}$$

6/8 Add & subtract fractions

- Make the denominators the same

e.g. $\frac{1}{5} + \frac{7}{10}$	e.g. $\frac{4}{5} - \frac{2}{3}$
$= \frac{2}{10} + \frac{7}{10}$	$= \frac{12}{15} - \frac{10}{15}$
$= \frac{9}{10}$	$= \frac{2}{15}$

Do not add denominators

6/9 Multiply fractions

- Write 5 as $\frac{5}{1}$
- Multiply numerators & denominators

e.g. $5 \times \frac{2}{3}$	e.g. $\frac{4}{5} \times \frac{2}{3}$
$= \frac{5}{1} \times \frac{2}{3}$	$= \frac{8}{15}$
$= \frac{10}{3} = 3\frac{1}{3}$	

6/9 Divide fractions

- Write 5 as $\frac{5}{1}$
- Invert the fraction after ÷ sign
- Multiply numerators & denominators

e.g. $\frac{2}{3} \div 5$	e.g. $\frac{4}{5} \div \frac{2}{3}$
$= \frac{3}{2} \times \frac{1}{5}$	$= \frac{4}{5} \times \frac{3}{2}$
$= \frac{3}{10}$	$= \frac{12}{10} = 1\frac{2}{10} = 1\frac{1}{5}$

6/10 Multiply/divide decimals by 10, 100

thousands	hundreds	tens	units	●	tenths	hundredths	thousandths
4	3	5	2		6	1	7
				●			

- **To multiply by 10,** move each digit one place to the <u>left</u>

e.g. 35.6 x 10 = 356

Hundreds	Tens	Units	●	tenths
	3	5	●	6
3	5	6	●	

- **To divide by 10**, move each digit one place to the <u>right</u>

e.g. 35.6 ÷ 10 = 356= 3.56

Tens	Units	●	tenths	hundredths
3	5	●	6	
	3	●	5	6

- **To multiply by 100,** move each digit 2 places to the <u>left</u>

- **To divide by 100,** move each digit 2 places to the <u>right</u>

AN ALTERNATE METHOD
Instead of moving the <u>digits</u>
Move the <u>decimal point the opposite way</u>

6/11 Multiply decimals

Step 1 – remove the decimal point
Step 2 – multiply the two numbers
Step 3 – Put the decimal back in

Example: 0.06 x 8
=>   6 x 8
=>   48
=> 0.48

6/11 Divide decimals
Use the bus shelter method
Keep the decimal point in the same place
Add zeros for remainders

Example: 6.28 ÷ 5
$$\begin{array}{r} 1 \ . \ 2 \ 5 \ 6 \\ \hline 5 \ ) \ 6 \ . \ 1_22_28_30 \end{array}$$

6/12 Fraction, decimal, percentage equivalents

LEARN THESE:

$$\frac{1}{4} = 0.25 = 25\%$$

$$\frac{1}{2} = 0.5 = 50\%$$

$$\frac{3}{4} = 0.75 = 75\%$$

$$\frac{1}{10} = 0.1 = 10\%$$

- **Percentage to decimal to fraction**

$$27\% = 0.27 = \frac{27}{100}$$

$$7\% = 0.07 = \frac{7}{100}$$

$$70\% = 0.7 = \frac{70}{100} = \frac{7}{10}$$

- **Decimal to percentage to fraction**

$$0.3 = 30\% = \frac{3}{10}$$

$$0.03 = 3\% = \frac{3}{100}$$

$$0.39 = 39\% = \frac{39}{100}$$

- **Fraction to decimal to percentage**

$$\frac{4}{5} = \frac{80}{100} = 80\% = 0.8$$

Change to 100

$$\frac{3}{8} = 3 \div 8 = \overset{0.375}{8)3.^30^60^40} = 0.375 = 37.5\%$$

$$\frac{9}{12} = \frac{3}{4} = 0.75 = 75\%$$

Cancel by 3

6/13 Fraction of quantity

- $\frac{4}{5}$ means $\div 5 \times 4$

e.g. To find $\frac{4}{5}$ of £40

$$£40 \div 5 \times 4 = £40$$

6/13 Percentage of quantity

Use only

- 50% - $\frac{1}{2}$
- 10% - $\frac{1}{10}$
- 1% - $\frac{1}{100}$

Example : To find 35% of £400
10% = £40
20% = £80
5% = £20
35% = £140

6/14 Similar shapes

When a shape is enlarged by a scale factor the two shapes are called SIMILAR shapes
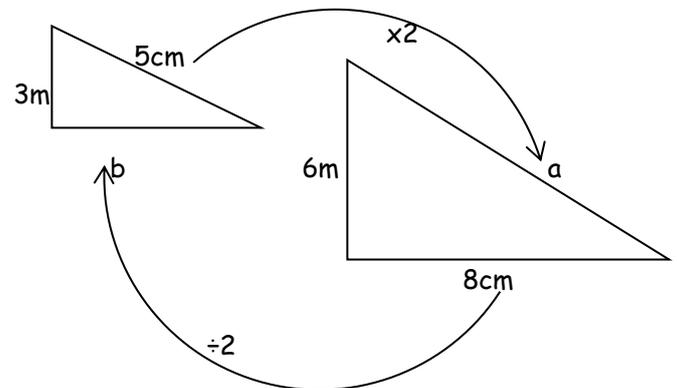
Scale factor = 6 ÷ 3 = 2
Length a = 5 x 2 = 10cm
Length b = 8 ÷ 2 = 4cm

6/14 Unequal sharing

Example- unequal sharing of sweets

A gets	B gets
3 shares	4 shares
=> 3 sweets	4 sweets
=> 12 sweets	16 sweets

×4 (A), ×4 (B)

6/15 Express missing numbers

algebraically

An unknown number is given a letter

Examples

$2a - 4 = 8$

$2a = 12$ so $a = 6$

$b + 32 = 180$ so $b = 148°$

b 32°

30cm

18cm   c

$18 + c = 30$ so $c = 12$

d   d

d
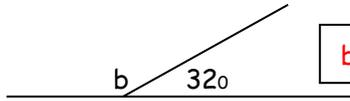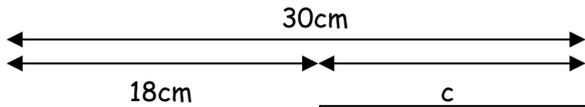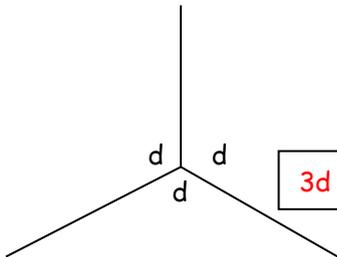
$3d = 360°$ so $d = 120°$

- -

6/15 Use a word formula

Example: -Time to cook a turkey
Cook for 45min per kg weight
Then a further 45min

For a 6kg turkey, <u>follow the formula</u>:

45min x 6 + 45min

=270min + 45min

=315min

= <u>5h 15min</u>

6/16 Number sequences

- **Understand position and term**

Position	1	2	3	4
Term	3	7	11	15

+4

Term to term rule = +**4**

Position to term rule is × **4** - 1

(because position 1 x 4 – 1 = 3)

nth term = n x 4 -1 = 4n - 1

- **Generate terms of a sequence**

If the nth term is $5n + 1$

1st term *(n=1)* = $5 \times 1 + 1 = 6$

2nd term *(n=2)* = $5 \times 2 + 1 = 11$

3rd term *(n=3)* = $5 \times 3 + 1 = 16$

6/17 Possible solutions of a number sentence

Example: x and y are numbers

Rule: $x + y = 5$

Possible solutions: $x = 0$ and $y = 5$

$x = 1$ and $y = 4$

$x = 2$ and $y = 3$

$x = 3$ and $y = 2$

$x = 4$ and $y = 1$

$x = 5$ and $y = 0$

6/18 Convert units of measure
METRIC

When converting measurements follow these rules:

• When converting from a **larger unit to a smaller** unit we **multiply** (x)

• When converting from a **smaller unit to a larger** unit we **divide** (÷)

UNITS of LENGTH
10mm = 1cm
100cm = 1m
1000m = 1km

UNITS of MASS
1000g = 1kg
1000kg = 1tonne

UNITS of VOLUME
1000ml = 1 litre
100cl = 1litre

UNITS of TIME
60sec = 1 min
60min = 1 hour
24h   = 1 day
365days = 1 year

6/19 Convert units of measure
METRIC/IMPERIAL

LEARN: 5 miles = 8km
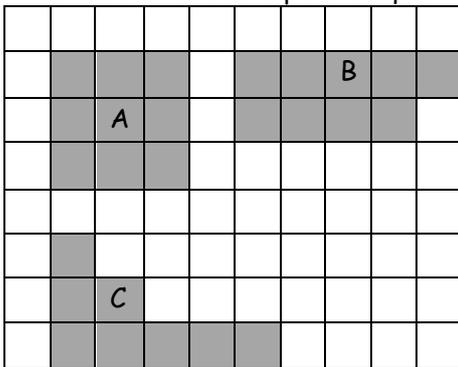
Miles ⟶ ÷ 5 ⟶ x8 ⟶ kilometres

Miles ⟵ x 5 ⟵ ÷8 ⟵ kilometres
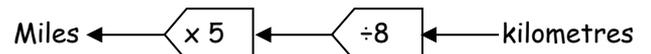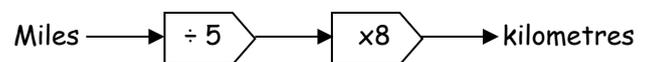
6/20 Perimeter and area of shapes

Shapes can have the SAME area but different perimeters
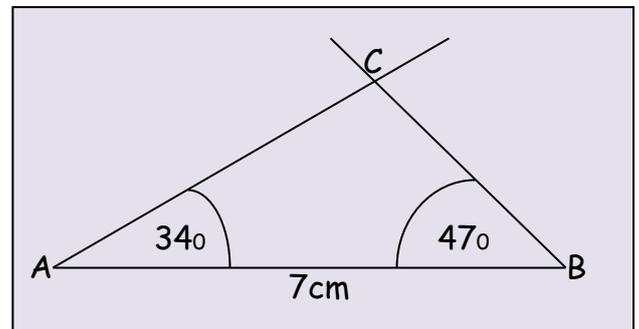
The area of each shape is 9 squares

Perimeter of each shape is different
A – 12; B – 14; C -16

Example : Triangle with side and angles given
- o Draw line AB = 7cm
- o Draw angle 34^0 at point A from line AB
- o Draw angle 47^0 at point B from line AB
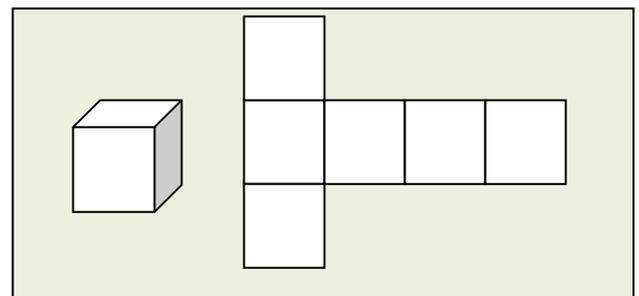- o Extend to intersect the lines at C

6/21 Area of parallelogram & triangle

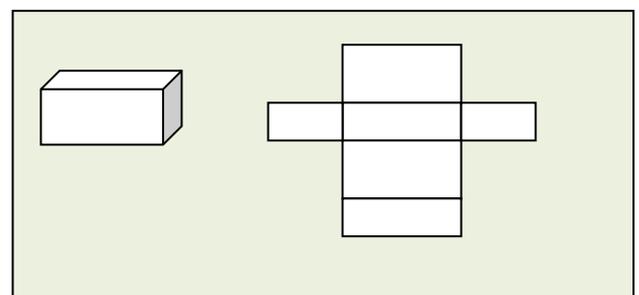- o **Area of parallelogram**

Area of parallelogram = b x h
= 8 x 5
= 40cm^2

- o **Area of triangle (½ a parallelogram)**

Area of triangle = $\frac{b \times h}{2}$

= $\frac{8 \times 5}{2}$

20cm^2

6/22 Volume

- o **Volume of cuboid**

Volume = l x w x h
= 5 x 3 x 2
= 30cm^3

- o **Volume of cube**

Volume = l x w x h
= 3 x 3 x 3
= 27m^3

6/23 Construct 3D shapes

CUBE & its net

CUBOID & its net

TRIANGULAR PRISM & its net
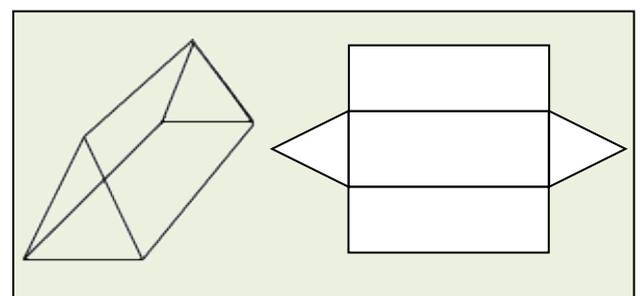
6/23 Construct 2D shapes

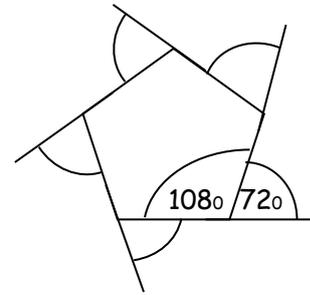## 6/24 Properties of shapes

TRIANGLES – sum of angles = 180°

ISOSCELES triangle
2 equal sides & 2 equal angles
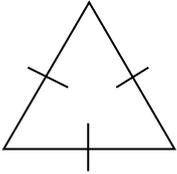
EQUILATERAL triangle
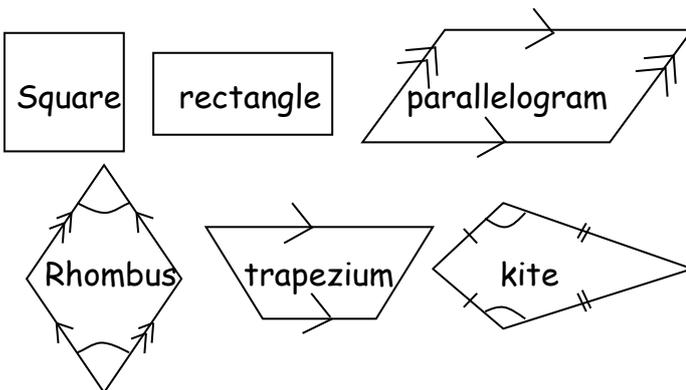3 equal sides & ALL angles 60°
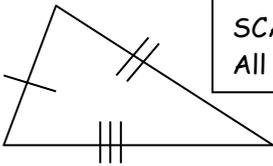
SCALENE triangle
All sides & angles different

108° 72°

- o   interior & exterior angle add up to 180°

- o   the interior angles add up to:

Triangle $= 1 \times 180^\circ = 180^\circ$
Quadrilateral $= 2 \times 180^\circ = 360^\circ$
Pentagon $= 3 \times 180^\circ = 540^\circ$
Hexagon $= 4 \times 180^\circ = 720^\circ$ etc

QUADRILATERALS – sum of angles = 360°

Square   rectangle   parallelogram

Rhombus   trapezium   kite

6/25 Parts of a circle
- o   The circumference is the distance all the way around a circle.
- o   The diameter is the distance right across the middle of the circle, passing through the centre.
- o   The radius is the distance halfway across the circle.
- o   The radius is always half the length of the diameter. ($d = 2 \times r$) or ($r = \frac{1}{2} \times d$)
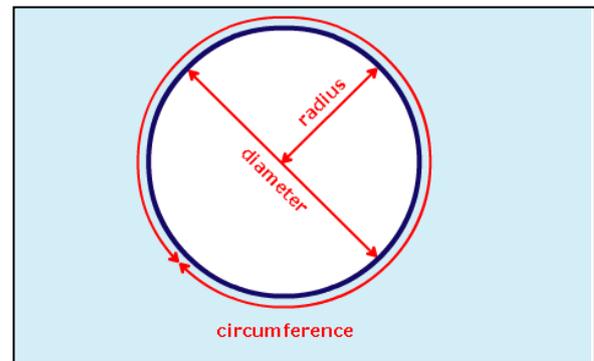
REGULAR POLGONS – all sides the same
- o   Polygons have straight sides
- o   Polygons are named by the number sides
      3 sides – triangle
      4 sides – quadrilateral
      5 sides – pentagon
      6 sides – hexagon
      7 sides – heptagon
      8 sides – octagon
      9 sides – nonagon
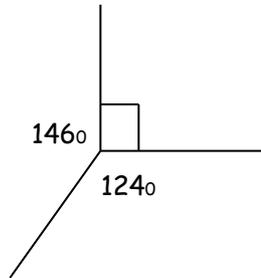   10 sides – decagon

- o   Sum of exterior angles is always 360°

6/26 Angles and straight lines

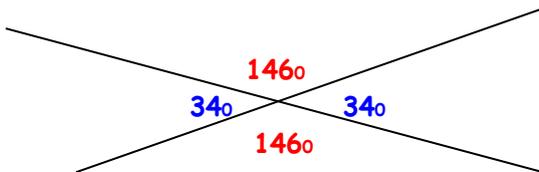- Angles on a straight line add up to $180°$
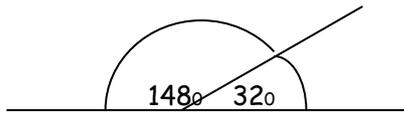
$$148° + 32° = 180°$$

- Angles about a point add up to $360°$

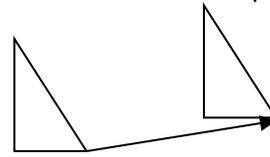$$146° + 90° + 124° = 360°$$

- Vertically opposite angles are equal

146°
34°   34°
146°

6/27 Position on a co-ordinate grid

(-6,4)   (6,4)
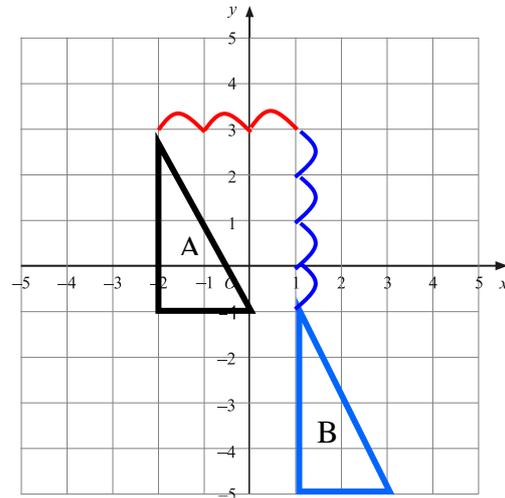
(-6,-4)   (6,-4)

6/28 Transformations

- **Translation -** A shape moved along a line

Example – Move shape A 3 right & 4 down
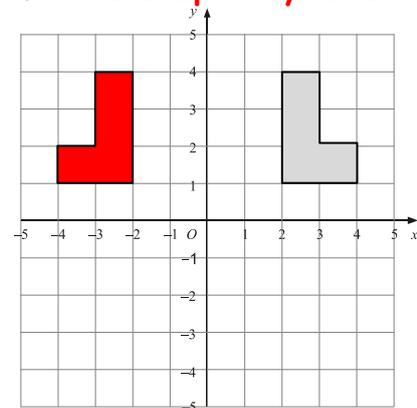Can also be written as a vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$ Right Down

Notice:
- The new shape stays the same way up
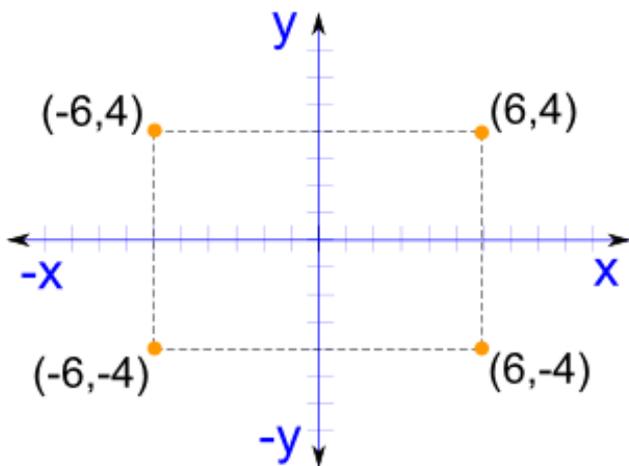- The new shape is the same size

- **Reflect a shape in x-axis**
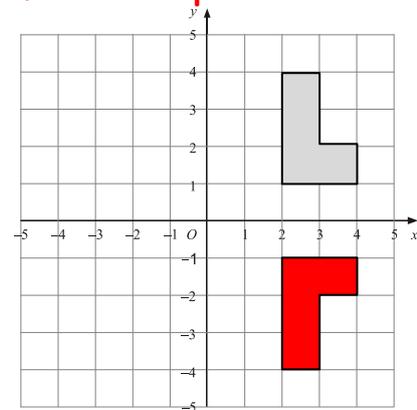
- **Reflect a shape in y-axis**

6/29 Graphs

- **Pie chart**
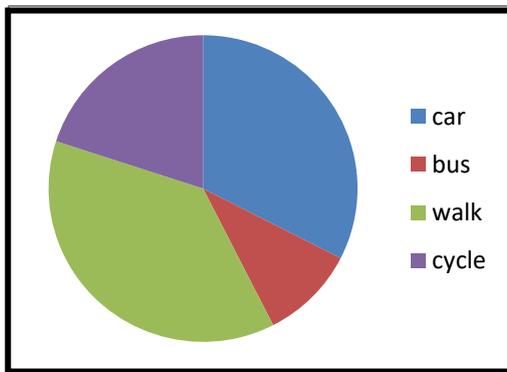
Transport	Frequency	Angle
Car	13	$13 \times 9 = 117°$
Bus	4	$4 \times 9 = 36°$
Walk	15	$15 \times 9 = 135$
Cycle	8	$8 \times 9 = 72$

Total frequency = 40

$360° \div 40 = 9°$ per person

- **Line graph**

Line graphs show changes in a single variable – in this graph changes in temperature can be observed.
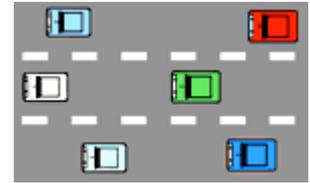

6/30 The mean

The mean is usually known as the average.
The mean is not a value from the original list.
It is a typical value of a set of data

> Mean = total of measures ÷ no. of measures

e.g.- Find mean speed of 6 cars travelling on a road
Car 1 – 66mph
Car 2 – 57mph
Car 3 – 71mph
Car 4 – 54mph
Car 5 – 69mph
Car 6 – 58mph

Mean = $\dfrac{66+57+71+54+69+58}{6}$

$= \dfrac{375}{6}$

= 62.5mph

Mean average speed was 62.5mph