Grade 4 PROMPT sheet

D/1 Equivalent fractions, decimals & percentages

- **Percentage to decimal to fraction**

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

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

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

- **Decimal to percentage to fraction**

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

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

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

- **Fraction to decimal to percentage**

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

Change to 100

$\dfrac{3}{8} = 3 \div 8 = 0.375 = 37.5\%$

D/2 Increase/Decrease by a percentage

- **To increase £12 by 5%**

= **1.05 x £12**   *(100% + 5% = 105%)*

OR

= *£12 + 5% of £12*

- **To decrease £50 by 15%**

= **0.85 x £50**   *(100% - 15% = 85%)*

OR

= **£50 – 15% of £50**

D/3 Divide a quantity into a given ratio

~ Put headings
~ Find how many shares in total
~ Amount ÷ no. shares = value of one share

e.g. Divide £240 between A and B in ratio of 3:5

A : B
3 : 5 = 8 shares

One share = £240 ÷ 8 = £30
A = 3 shares = 3 x £30 = £90
B = 5 shares = 5 x £30 = £150

D/4 Use proportional reasoning

- **Change an amount in proportion**

e.g. If 6 books cost £22.50
Find the cost of 11. *(find cost of 1 first)*

- **Change amounts to compare**

e.g. A pack of 5 pens cost £6.10
A pack of 8 pens cost £9.20
Which is the best buy? *(find cost of 40 of each)*

D/5 Calculate with fractions

- **Add & subtract fractions**

~Make the denominators the same

e.g.

$\dfrac{1}{5} + \dfrac{7}{10}$

$= \dfrac{2}{10} + \dfrac{7}{10}$

$= \dfrac{9}{10}$

$\dfrac{4}{5} - \dfrac{10}{15}$

$= \dfrac{12}{15} - \dfrac{10}{15}$

$= \dfrac{2}{15}$

- **Multiply fractions**

~Write 7 as $\dfrac{7}{1}$

~Multiply numerators & denominators

e.g. $5 \times \dfrac{2}{3}$

$= \dfrac{5}{1} \times \dfrac{2}{3}$

$= \dfrac{10}{3} = 3\dfrac{1}{3}$

$\dfrac{4}{5} \times \dfrac{2}{3}$

$= \dfrac{8}{15}$

- **Divide fractions**

~Write 7 as $\frac{7}{1}$

~Flip numerator & denominator after ÷
~Multiply numerators & denominators

e.g. $5 \div \frac{2}{3}$	$\frac{4}{5} \div \frac{2}{3}$
$= \frac{5}{1} \times \frac{3}{2}$	$= \frac{4}{5} \times \frac{3}{2}$
$= \frac{15}{2} = 7\frac{1}{2}$	$= \frac{12}{10} = 1\frac{2}{10} = 1\frac{1}{5}$

- **Calculate fraction of quantity**

To find $\frac{4}{5}$ of a quantity   ÷ 5 × 4

e.g. $\frac{4}{5}$ of £20 = 20 ÷ 5 × 4 = £16

D/6 Solve an equation by trial & improvement method

~ Find 2 consecutive numbers that the solution lies between
~ Then choose the half way number
~ Keep making improvements until the required accuracy achieved

e.g. To solve $x^3 - 3x = 6$ (correct to 1dp)

Try x =	$x^3 - 3x$	Comment
2	$2^3 - 2\times2 = 4$	Too small
3	$3^3 - 3\times3 = 28$	Too big
2.5	$2.5^3 - 3\times2.5 = 8.125$	Too big
2.3	$2.3^3 - 3\times2.3 = 5.267$	Too small
2.4	$2.4^3 - 3\times2.4 = 6.624$	Too big
2.35	$2.35^3 - 3\times2.35 = 5.928$	Too small

Solution is nearer 2.4 than 2.3
                    So x = 2.4 (correct to 1dp)

D/7 Solve linear equations

~Multiply out brackets first
~If there are letters on both sides get rid of the smaller first
~Do the same to both sides
e.g.
To solve $5(x - 3) = 3x + 7$ (expand bracket)
        $5x - 15 = 3x + 7$ (-3x from both sides)
        $2x - 15 = + 7$ (+15 to each side)
        $\underline{2x} = \underline{22}$ (÷2 both sides)
        $2 2$
        $\underline{x = 11}$
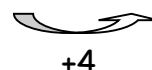
D/8 Sequences

- **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 × 4 -1 = 4n - 1

- **Generate terms of a sequence**

If the nth term is 5n + 1
1st term *(n=1)* = 5×1 + 1 = 6
2nd term *(n=2)* = 5×2 + 1 = 11
3rd term *(n=3)* = 5×3 + 1 = 16

D/9 Plot graphs of linear equations

~Substitute values of x into the equation
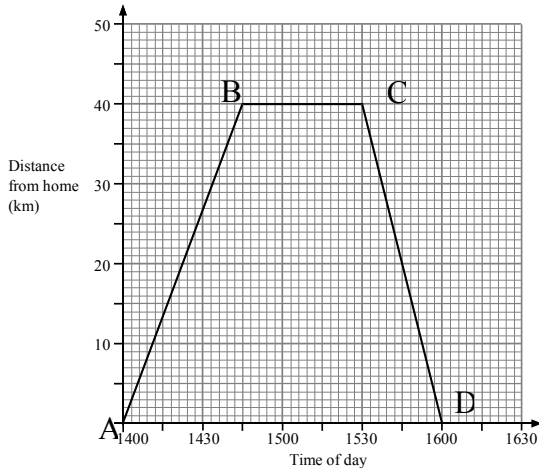~Plot the points in pencil
~Join the points with a ruler and pencil
~They should be in a straight line

e.g. y = 3x – 1

x	-2	-1	0	1	2
y	-7	-4	-1	2	5

D/10&11 Real life graphs
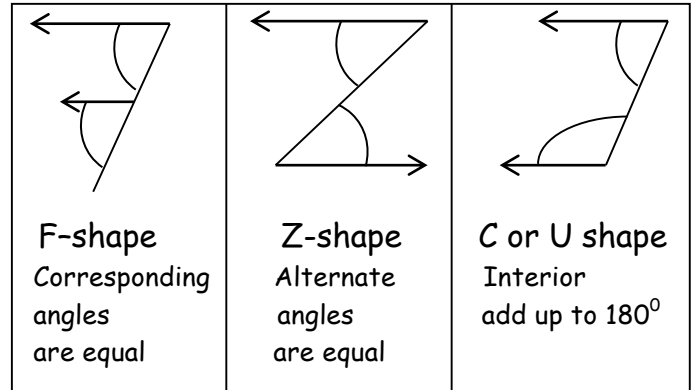### Some examples

- AB shows the journey away
- BC shows no movement
- CD shows journey back
- The steeper the line the higher the speed
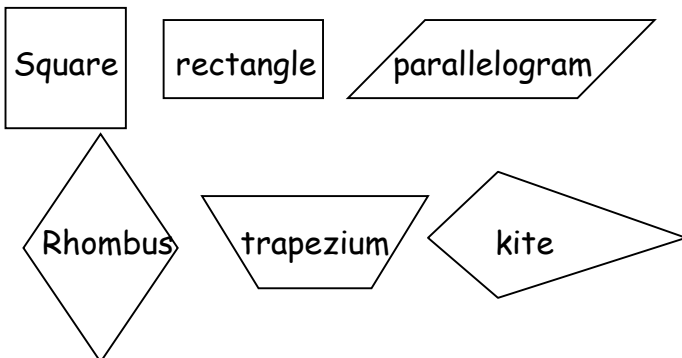
Matching graphs to statements

The price of oil, which was rising steadily at the beginning of the year, is now beginning to fall.

Unemployment has been falling steadily over the last year.

The birth rate was falling rapidly but is now steady.

House prices, which were rising slowly, are now starting to rise rapidly.

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D/12 Quadrilaterals & their properties

Square   rectangle   parallelogram

Rhombus   trapezium   kite

- Know the name of each quadrilateral
- Does it have line and/or rotational symmetry?
- Are the diagonals equal or bisect each other?
- Does it have parallel sides?
- Are angles equal or opposites equal?

D/13&14&15 Angles

- ### Angles & parallel lines

F-shape	Z-shape	C or U shape
Corresponding angles are equal	Alternate angles are equal	Interior add up to 180^0

- ### Angles and straight lines
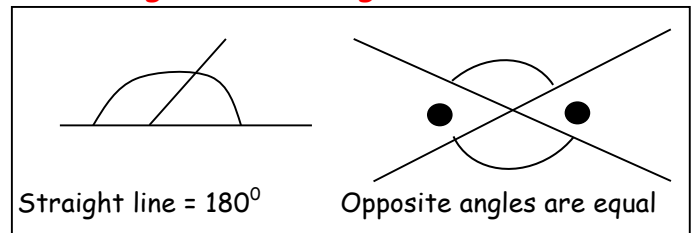
Straight line = 180^0 Opposite angles are equal

- ### Angles of polygons
~Polygons have straight sides
~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

~With ALL sides equal they are called REGULAR
~ Sum of exterior angles is always 360^0

108^0 72^0
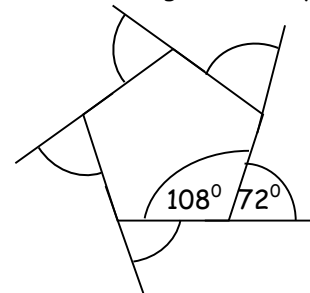
~ the interior & exterior angle add up to 180^0

~ the interior angles add up to:
Triangle = $1 \times 180^0 = 180^0$
Quadrialteral = $2 \times 180^0 = 360^0$
Pentagon = $3 \times 180^0 = 540^0$
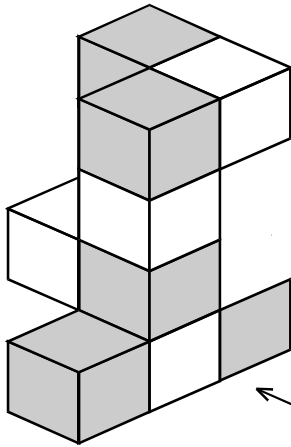Hexagon = $4 \times 180^0 = 720^0$ etc

D/16 2D representations of 3D shapes

- **3D drawing on isometric paper**
  (notice NO horizontal lines)
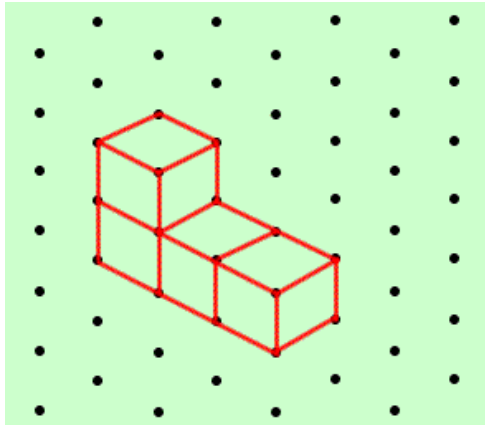
- **3 views of a 3D shape**

Plan view
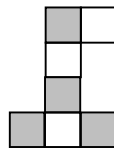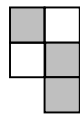↓
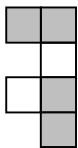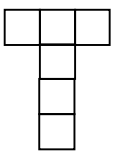

side–view

front elevation

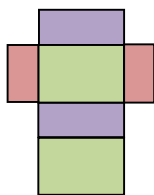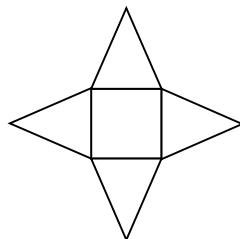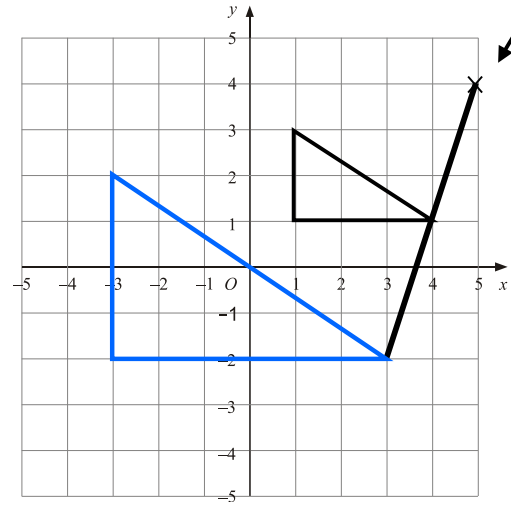| Side view	Plan view	Front elevation

- **Nets**

Cube   Cuboid   Square based pyramid

D/17 Enlarge a shape

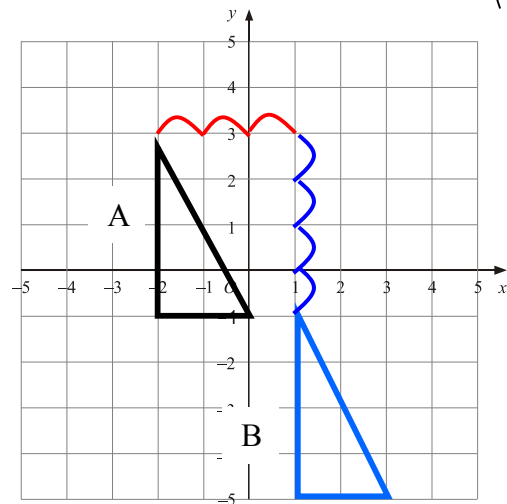You need to know:
- Centre   e.g. (5, 4)
- Scale factor   e.g. 2

D/18 Translate & Reflect a shape

- **Translate a shape**

You need to know:
- Vector from A to B   e.g. $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$ Right Down

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

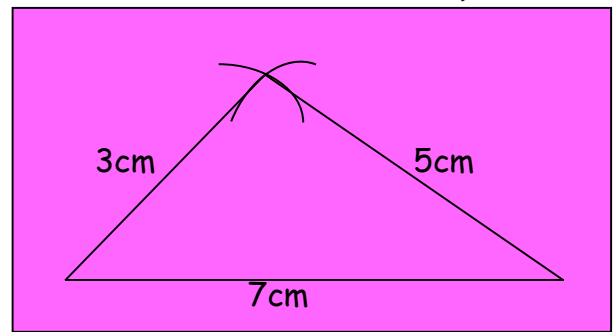*USE TRACING PAPER TO HELP*

Reflect a shape

You need to know:
- Angle e.g. 90^0
- Direction e.g. clockwise
- Centre of rotation e.g.(0,0)
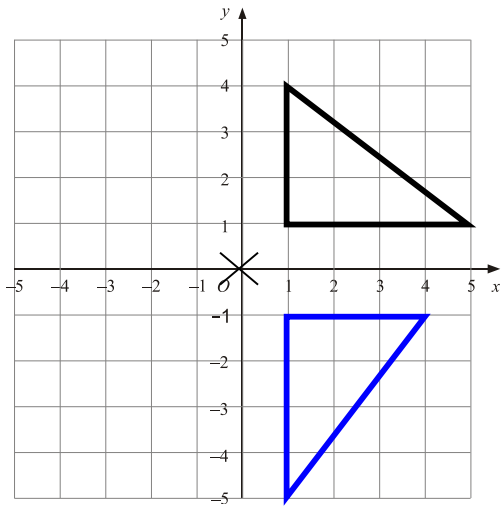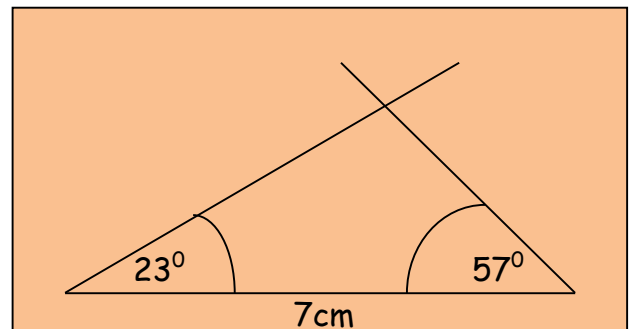

USE TRACING PAPER TO HELP

Construct triangle given 3 sides
*(Use a pair of compasses
Leave the arcs on)*

3cm   5cm
7cm

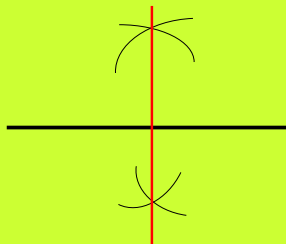## Construct triangle given angles
(Use a protractor)

23^0 57^0
7cm

D/19 Constructions

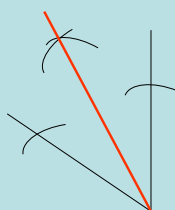### Perpendicular bisector of a line

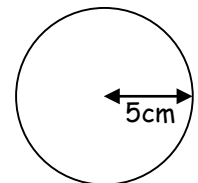Draw a straight line through where the arcs cross above and below.

Bisector of a line

Draw a line from where the arcs cross to the vertex of the angle
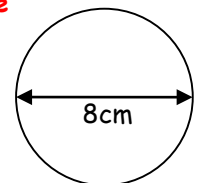

D/20 Use formulae

Area of circle
Area of circle = $\pi \times r^2$
$= \pi \times r^2$
$= \pi \times 5^2$
$= \underline{78.5cm^2}$

5cm

Circumference of circle
Area of circle = $\pi \times d$
$= \pi \times 8$
$= 25.1cm$

8cm

Volume of cuboid
Volume = $l \times w \times h$
$= 5 \times 3 \times 2$
$= 30cm^3$
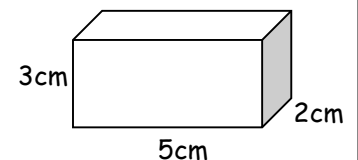
3cm
5cm
2cm

Surface area of cuboid
Front = 5x3 = 15
Back = 5x3 = 15
Top = 5x2 = 10
Bottom = 5x2 = 10
Side = 3x2 = 6
Side = 3x2 = 6

Total Surface Area = $62cm^2$

D/23 Presentation of data

- ### Construct a pie chart

Transport	Frequency	Angle
Car	13 x 9	117^0
Bus	4 x 9	36^0
Walk	15 x 9	135
Cycle	8 x 9	72

Total frequency = 40

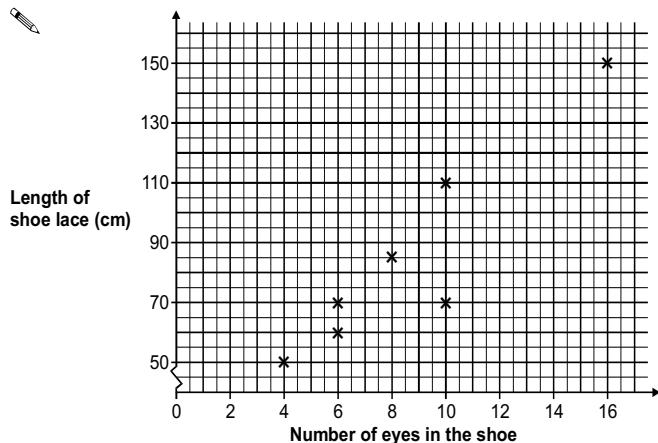$360^0 \div 40 = 9^0$ per person

- ### Construct a frequency polygon
  (points plotted at the midpoint of the bars)
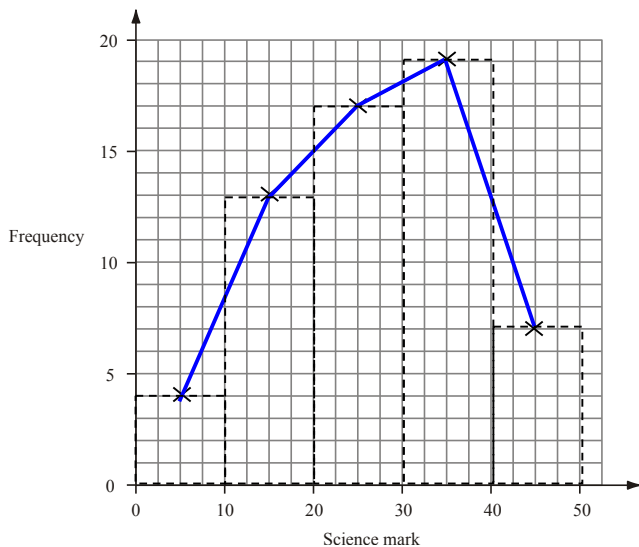
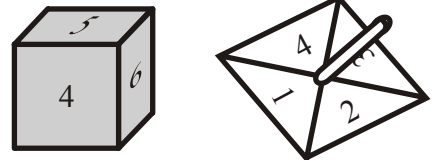- ### Construct a scatter graph

D/24 Find all possible outcomes

Outcomes can be presented:
- **In a list**
- **In a table or sample space**

Example of a sample space
To show all possible outcomes from spinning a spinner and rolling a dice

		Dice					
	+	**1**	**2**	**3**	**4**	**5**	**6**
Spinner	**1**	2	3	4	5	6	7
	2	3					
	3	4					
	4	5					

D/25 Sum of mutually exclusive outcomes =1

- **If 2 outcomes cannot occur together, They are mutually exclusive**
- **If 2 outcomes A and B are mutually exclusive**
  P(A) + p(B) = 1
- **If 3 outcomes A B and C are mutually exclusive**
  P(A) + p(B) + p(C) = 1

e.g. If outcomes A, B and C are mutually exclusive and

p(A) = 0.47

p(B) = 0.31

p(C) = 1 – (0.47 + 0.31)

= 1 – 0.78

= 0.22