

Number facts:

Revise all number facts from Year 7 & 8 including: times tables, prime numbers, square numbers, cubic numbers, triangular numbers. Be able to define and apply concepts of factor and multiple.

Standard form is a way of writing down very large or very small numbers easily using powers of ten.

The generic way of writing numbers in standard form is:
 $a \times 10^n$

(where a is a number greater than or equal to 1 and less than 10 and n is an integer, if n is positive the number will be greater than or equal to 1, if n is negative then the number will be less than one)

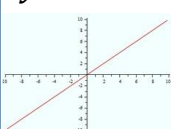
Algebra facts:

Generic **linear** equation for graphs: $y = mx + c$
 where (x, y) are coordinates and m = gradient and c = y-intercept.

Generic **quadratic** equation for graphs: $y = ax^2 + bx + c$
 where a, b and c are variables.

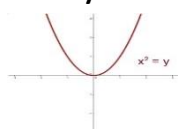
Graphs of common equations:

$$y = x$$



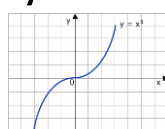
linear

$$y = x^2$$



quadratic

$$y = x^3$$

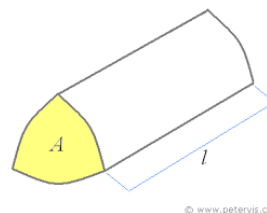


cubic

Shape facts:

Volume:

Cube and Cuboid = height x width x length
 Any Prism = area of cross section (A) x length (l)
 and Cylinder = $\pi r^2 h$
 where r = radius and h = height or length



Surface area of 3d shapes:

Cube = $6a^2$ where a = length of one edge
 Cuboid = $2lh + 2wh + 2lb$
 where l = length, w = width, h = height
 Cylinder = $2\pi rh + 2\pi r^2 h$
 where r = radius and h = height or length

Transformations:

A transformation changes the position or the size of a shape, there are 4 basic ways of transforming 2D shapes:

Translation

- Needs vector or movement across and up

Reflection

- Needs line of symmetry

Rotation

- Needs centre, angle and direction

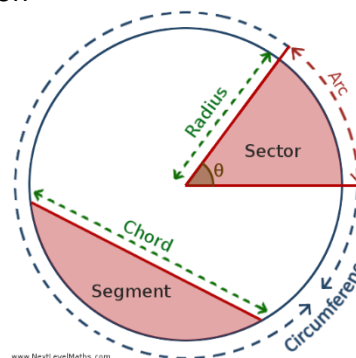
Enlargement

- Needs scale factor and centre

Circles

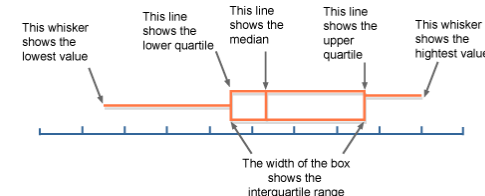
Area = πr^2 ,
 Circumference = $2\pi r$

$\pi = 3.14159265 \dots$



Statistics & probability:

A box plot is a diagram which shows the median, the quartiles and the range of a data set.



Geometry:

Pythagoras' theorem: $h^2 = a^2 + b^2$

A **bearing** is the direction to one place from another. Need to remember:

- Always work clockwise from North
- Always give a bearing in degrees as a three figure bearing

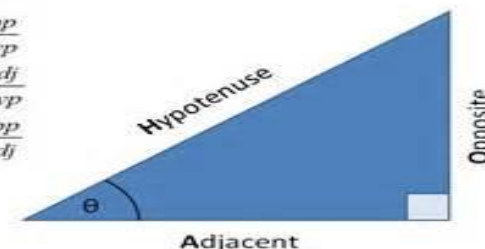
Trigonometry relationships

SOHCAHTOA

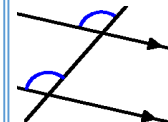
$$\sin(\theta) = \frac{\text{Opp}}{\text{Hyp}}$$

$$\cos(\theta) = \frac{\text{Adj}}{\text{Hyp}}$$

$$\tan(\theta) = \frac{\text{Opp}}{\text{Adj}}$$



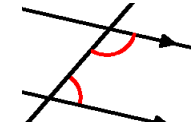
Angles



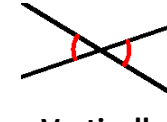
Corresponding
 angles are
 equal



Alternate
 angles are
 equal



Co-interior
 angles add to
 180°



Vertically
 opposite
 angles are
 equal