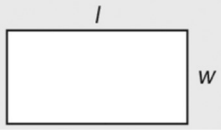
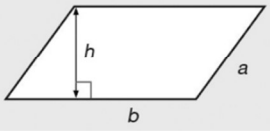
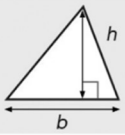
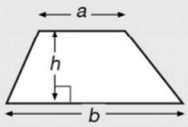
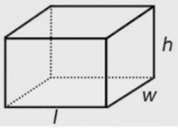
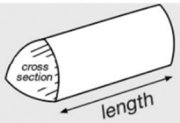
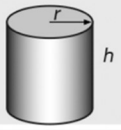
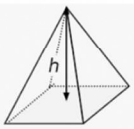
Class 5 + 4 Mathematics Formula sheet

Shape

Areas

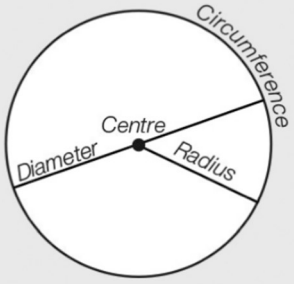
Rectangle = $l \times w$	
Parallelogram = $b \times h$	
Triangle = $\frac{1}{2} b \times h$	
Trapezium = $\frac{1}{2}(a + b)h$	

Volumes

Cuboid = $l \times w \times h$	
Prism = area of cross section × length	
Cylinder = $\pi r^2 h$	
Pyramid = $\frac{1}{3}$ × area of base × h	

Volume of a right cone	$V = \frac{1}{3}\pi r^2 h$, where r is the radius, h is the height
Area of the curved surface of a cone	$A = \pi r l$, where r is the radius, l is the slant height
Volume of a sphere	$V = \frac{4}{3}\pi r^3$, where r is the radius
Surface area of a sphere	$A = 4\pi r^2$, where r is the radius

Circles

Circumference = $\pi \times$ diameter, $C = \pi d$	
Circumference = $2 \times \pi \times$ radius, $C = 2\pi r$	
Area of a circle = π x radius squared, $A = \pi r^2$	

Arcs and Sectors

Area of a Sector

$$A = \frac{\theta}{360°} \times \pi r^2$$

Length of an Arc

$$A = \frac{\theta}{360°} \times \pi d$$

Angles in Polygons

$$\text{Sum of Interior Angles} = (n - 2) \times 180°$$

Where n is the number of sides of the shape

Exterior Angles add up to 360°

One exterior angle in a REGULAR polygon:

$$\frac{360°}{n}$$

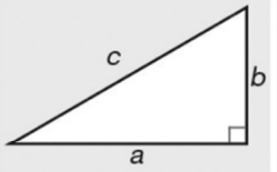
Pairs of Interior and Exterior Angles add up to 180°

Geometry

Pythagoras

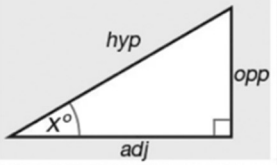
Pythagoras' Theorem

For a right-angled triangle,
$a^2 + b^2 = c^2$



Trigonometric ratios (*new to F*)

$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}$, $\cos x^\circ = \frac{\text{adj}}{\text{hyp}}$, $\tan x^\circ = \frac{\text{opp}}{\text{adj}}$

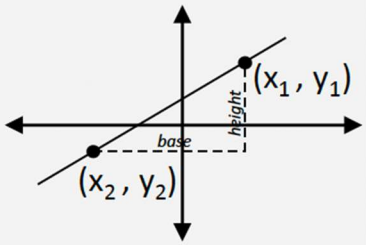


Gradient of a Line

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

or

$$m = \frac{\text{height}}{\text{base}}$$



Midpoint of two points

between (x_1 , y_1) and (x_2 , y_2) $\left(\frac{x_1 + x_2}{2}, \frac{x_1 + y_2}{2}\right)$

Distance between two points

between (x_1 , y_1) and (x_2 , y_2) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Number and algebra

Compound Growth & Decay

The amount after *n* years (or days, etc.) is:

$$\text{starting amount} \times \left(1 \pm \frac{r}{100}\right)^n$$

where *r* is the rate of change.
The $\pm$ means + for growth and – for decay

Quadratic Sequences

The n^{th} term of a quadratic sequence is in the form $an^2 + bn + c$, where

$2a$ = 2nd difference
$3a + b$ = 1st difference (between 1st and 2nd term)
$a + b + c$ = 1st term in the sequence

Speed

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$