THIRD SPACE LEARNING

Foundation

Area

Rectangle

Area = length x width

width (w)

length (l)
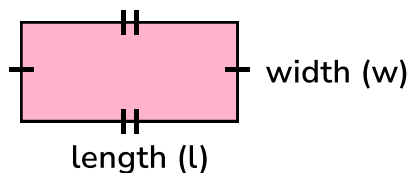
Parallelogram

Area = base x perpendicular height

Perpendicular height (h)

Base (b)

Triangle

Area = $\frac{1}{2}$ x base x height

height

base

Trapezium

a

h

b
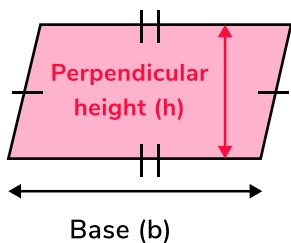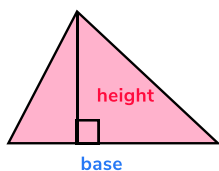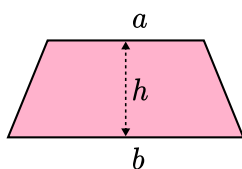
Area = $\frac{1}{2}(a+b)h$

Surface Area

Cylinder

h

r
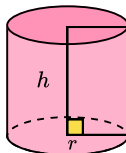
r = radius, h = height

Surface area = $2\pi rh + 2\pi r^2$

Pie Charts

The angle to draw for each sector is
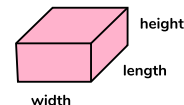
Angle = $\dfrac{\text{Frequency}}{\text{Total}}$ x 360°

Probability

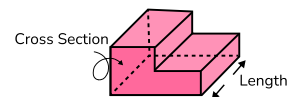$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
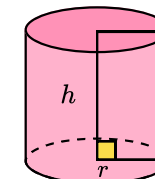
Volume

Cuboid

Volume = length x width x height

height

length

width

Prism

Volume = area of cross section x length

Cross Section

Length

Cylinder

h

r

r = radius, h = height

Volume = $\pi r^2 h$

Direct and Inverse Proportion

If x is directly proportional to y^n then

$x \propto y^n$ so $x = ky^n$

If x is inversely proportional to y^n then

$x \propto \dfrac{1}{y^n}$ so $x = \dfrac{k}{y^n}$

Straight Lines

Gradient
$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Equation of a Line
$y = mx + c$
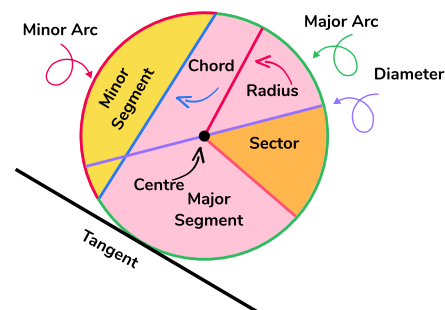
m = Gradient, $c = y$ intercept

Midpoint 2 points (x_1, y_1) and (x_2, y_2)

$(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2})$

Circles

r = radius, d = diameter

Area = πr^2

Circumference = πd or $2\pi r$

Minor Arc

Major Arc

Minor Segment

Chord

Radius

Diameter

Sector

Centre

Major Segment

Tangent

Percentage Change

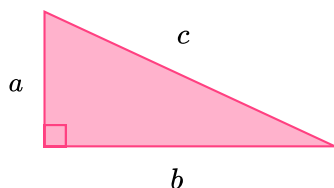Percentage change   = $(\dfrac{\text{Difference}}{\text{Original}}) \times 100$

Pythagoras
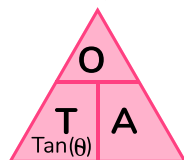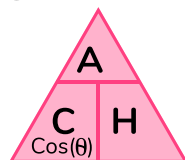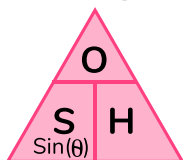
Note: Right angled triangles only

$$a^2 + b^2 = c^2$$

c is the **hypotenuse**
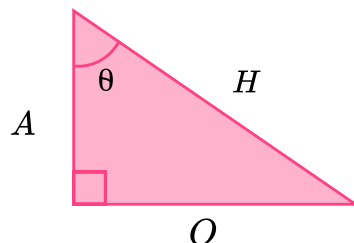(The longest side)

a and b are the shorter sides.

Compound Growth & Decay

The amount after n years (or days, etc), where percentage rate of change is r is
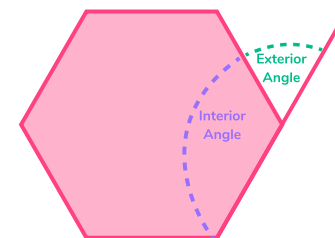
$$\text{Starting Amount } \times (1 \pm \frac{r}{100})^n$$

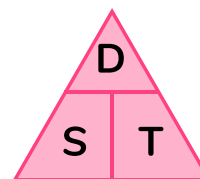# Angles in a Polygon

Exterior angle = $\dfrac{360}{n}$

n = number of sides

Interior angle + Exterior angle = 180°

Sum of interior angles = $(n-2) \times 180$

Exterior Angle

Interior Angle

Trigonometry

Note: Right angled triangles only

O
S H
Sin(θ)

A
C H
Cos(θ)

O
T A
Tan(θ)

$\text{Sin}\,\theta = \dfrac{\text{Opposite}}{\text{Hypotenuse}}$

$\text{Cos}\,\theta = \dfrac{\text{Adjacent}}{\text{Hypotenuse}}$

$\text{Tan}\,\theta = \dfrac{\text{Opposite}}{\text{Adjacent}}$

θ
H
A
O

Compound Measures

D
S T

M
D × V

F
P × A

Distance = Speed x Time

Speed = Distance ÷ Time

Time = Distance ÷ Speed
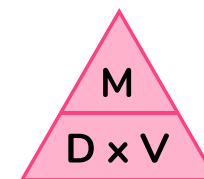
Mass = Density x Volume

Density = Mass ÷ Volume

Volume = Mass ÷ Density
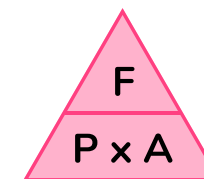
Force = Pressure x Area

Pressure = Force ÷ Area

Area = Force ÷ Area