

Information for Mocks Nov 2017 - Mathematics

**GCSE**

11AAG

All topics from the Edexcel GCSE (9-1) Higher textbook, apart from unit 19

11SSG

All topics from the Edexcel GCSE (9-1) Higher textbook, apart from unit 17-19

11ENA

All topics from the Edexcel GCSE (9-1) Foundation textbook, apart from Trigonometry and Vectors

**Useful websites:**

<http://www.mathsgenie.co.uk/>

<https://www.examsolutions.net/gcse-maths/>

[www.mymaths.co.uk](http://www.mymaths.co.uk) (logins required and have been provided to students)

<https://vle.mathswatch.co.uk/vle/> (logins required and have been provided to students)

## Formulae you need to know for FOUNDATION

You need to know these formulae. They will not be given in the exam.

Area of rectangle = $lw$
Area of parallelogram = $bh$
Area of triangle = $\frac{1}{2}bh$
Area of trapezium = $\frac{1}{2}(a + b)h$
Area of circle = $\pi r^2$
Circumference of circle = $\pi d = 2\pi r$
Volume of cuboid = $lwh$
Volume of prism = area of cross section $\times$ length
Volume of cylinder = $\pi r^2h$
Pythagoras' Theorem for a right-angled triangle where $c$ is the hypotenuse: $a^2 + b^2 = c^2$
Trigonometric ratios: $\sin x^\circ = \frac{\text{opp}}{\text{hyp}}$ $\cos x^\circ = \frac{\text{adj}}{\text{hyp}}$ $\tan x^\circ = \frac{\text{opp}}{\text{adj}}$
Compound measures:    Speed = $\frac{\text{distance}}{\text{time}}$ Density = $\frac{\text{mass}}{\text{volume}}$ Pressure = $\frac{\text{force}}{\text{area}}$

## Formulae you need to know for HIGHER

You need to know these formulae. They will not be given in the exam.  
Higher tier only formulae are marked 'H'.

	Area of rectangle = $lw$
	Area of parallelogram = $bh$
	Area of triangle = $\frac{1}{2}bh$
	Area of trapezium = $\frac{1}{2}(a + b)h$
	Area of circle = $\pi r^2$
	Circumference of circle = $\pi d = 2\pi r$
	Volume of cuboid = $lwh$
	Volume of prism = area of cross section $\times$ length
	Volume of cylinder = $\pi r^2 h$
<b>H</b>	Volume of pyramid = $\frac{1}{3} \times$ area of base $\times h$
	Pythagoras' Theorem for a right-angled triangle where $c$ is the hypotenuse: $a^2 + b^2 = c^2$
	Trigonometric ratios: $\sin x^\circ = \frac{\text{opp}}{\text{hyp}}$ $\cos x^\circ = \frac{\text{adj}}{\text{hyp}}$ $\tan x^\circ = \frac{\text{opp}}{\text{adj}}$
	Compound measures:    Speed = $\frac{\text{distance}}{\text{time}}$ Density = $\frac{\text{mass}}{\text{volume}}$ Pressure = $\frac{\text{force}}{\text{area}}$
<b>H</b>	Quadratic equation: The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
<b>H</b>	Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
<b>H</b>	Cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$
<b>H</b>	Area of triangle = $\frac{1}{2}ab \sin C$

These formulae will be given in the exam where needed. There will not be a separate formula sheet.

### Perimeter, area, surface area and volume formulae

Where  $r$  is the radius of the sphere or cone,  $l$  is the slant height of a cone and  $h$  is the perpendicular height of a cone:

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

### Kinematics formulae

Where  $a$  is constant acceleration,  $u$  is initial velocity,  $v$  is final velocity,  $s$  is displacement from the position when  $t = 0$ , and  $t$  is time:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$