Resources and Taster Activities
Get ready for a successful start!

Subject:	**A level Mathematics**
Subject Context:	Pure maths, Statistics and Mechanics
Reading List:	Good algebra skills
Essential resources or equipment required for the course:	You will require a calculator that has statistical distributions for example, Casio FX-991 CW. There are graphical calculators as well. Don't buy anything yet we will give you more information when you start lessons.
Taster Activity:	Please see following pages for the activity on solving different equations, a key skill to be a successful A level maths student
Resources needed to complete the activity:	Paper, pen, calculator
Estimated time required to complete the activity:	2 hours
How you could extend your learning:	You can find more transition to A level mathematics essential skills at https://amsp.org.uk/teachers/11-16-maths/transition-to-level-3-maths/

When you study A level you will need to solve a variety of different equations

Linear equations and inequalities

Can you solve the following equations and inequalities?

amsp | **Solving Linear 1** | ✓

Solve the following:

1. $8x - 3 = 5x + 13$

2. $3x + 1 > 10$ and $2x + 7 < 15$

3. $3(x + 6) > 12$

4. $24 - 3x = 9$

5. $14 \geq 8 + 5x$

6. $6 - 2x < 5x + 34$

7. $\dfrac{2x + 3}{7} = \dfrac{4x - 5}{3}$

8. The perimeter of the rectangle is 24cm. Find the value of x

x cm

$2x + 2$ cm

Quadratic Equations

1. Quadratic equations are used to model situations such as the height of an object. When the object hits the ground what is the vale of h? Can you find the corresponding value of t.
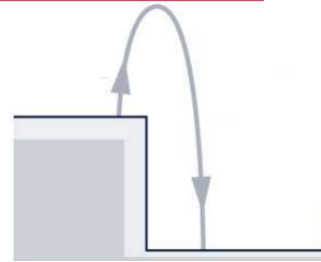

amsp   Up in the air!

An object is launched from a cliff that is $58.8m$ high.
The speed of the object is 19.6 metres per second (m/s).

The equation for the object's height h above the ground at time t seconds after launch is $h = -4.9t^2 + 19.6t + 58.8$ where h is in metres.
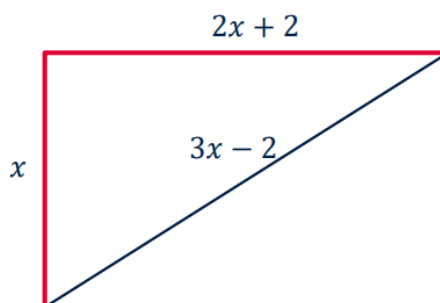
- When does the object strike the ground?

2. Can you form and solve a quadratic equation to solve the problem below

amsp   Quadthagoras

Find the length, width and diagonal of this rectangle

$2x + 2$

$3x - 2$

x

Other equations

 Other Equations

Solve the following:

1. $3^x = 243$

2. $2^{2x+3} = 128$
   Hint: write 128 in terms of powers of 2

3. $\sqrt{x + 3} = 7$

4. $2\sqrt{x} = \sqrt{12}$

5. $3\sqrt{x} + 12 = 7\sqrt{x}$

6. $\sin x = \frac{1}{2}$ $0 \le x \le 360$

7. $\cos x = 0.866$ $0 \le x \le 360$

8. $\frac{8}{3x+7} = 2$

Problem solving: Form and solve equations

 Piggy in the middle

The number in the middle of each group of 3 adjoining cells is the average of its two neighbours.

5			23	

What number goes in the right hand cell?

wqe | Wyggeston & Queen Elizabeth I College

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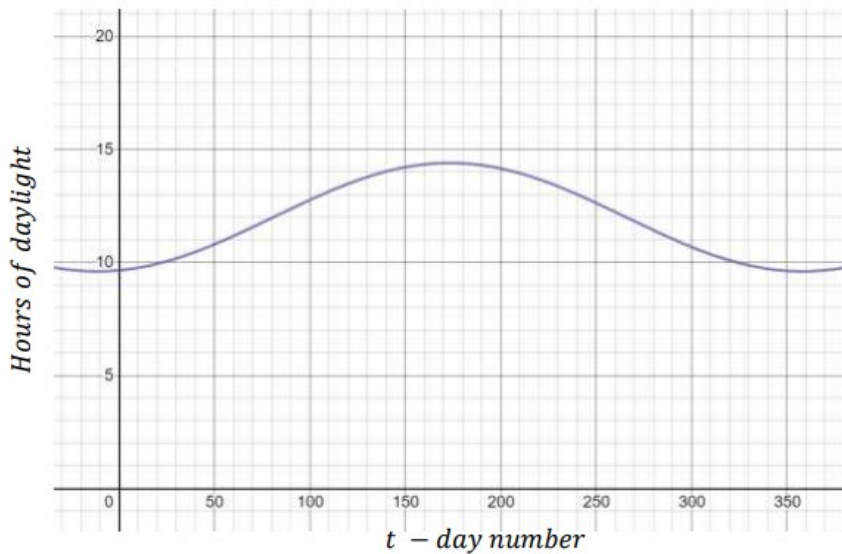## Solving equations involving Trigonometry

Did you know?

?

Sunrise and sunset times are modelled using trigonometrical equations

For San Diego, California, a simple equation to model daylight hours would be:

$$\text{Number of daylight hours} = 2.4\sin(0.017t - 1.377) + 12$$

where t is the day of year from 0 to 365

$t - day\ number$

From the graph can you tell which dates of the year are the shortest and longest day?

Are up for the challenge? how about having a go at the problem below.

Multiple Equations

If $\dfrac{ab}{a+b} = \dfrac{1}{4}$ and $\dfrac{bc}{b+c} = \dfrac{1}{2}$ and $\dfrac{ac}{a+c} = \dfrac{1}{8}$ find a, b and c