BRIDGING THE GAP

MATHEMATICS

Course Title	Examination Board & Web Address
A-Level Mathematics	Edexcel: www.edexcel.com

Units/Topics Studied:

The new specification contains all compulsory material and consists of 3 sections, Core maths, Mechanics and Statistics.

Core maths consists of algebra, functions, trigonometry, calculus and vectors.

Mechanics consists of force, kinematics, projectiles and calculus in kinematics

Statistics consists of data representation, sampling, hypothesis testing and statistical distributions such as the binomial and normal distributions.

Bridging Task

Part One:

Find out the answers to the following questions

1. $f(x) = x^2 - 4x + 9$, where k is a constant. Express f(x) in the form $(x - p)^2 + q$, where p and q are constants to be found. (Basically just completing the square).
2. Giving your answers in the form $a + b\sqrt{2}$, where a and b are rational numbers, find $(3 - \sqrt{8})^2$,
3. Given that $3^x = 9^{y-1}$, show that $x = 2y - 2$.
4. Solve the simultaneous equations: $x = 2y - 2$, and $x^2 = y^2 + 7$.
5. Find the set of values for x for which $6x - 7 < 2x + 3$.
6. What is the Sine Rule?
7. What is the Cosine Rule?
8. Solve $x^2 + 3x = 4$
9. What is the quadratic formula?
10. Solve $x^2 + 2x - 5 = 0$

> Useful websites:
>
> www.edexcel.com
>
> www.crashmaths.com
>
> www.mathedup.co.uk
>
> www.colmanweb.co.uk

Part Two:

Choose **ONE** of the following tasks to complete:

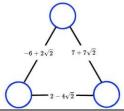| Sum of Series	Surds Problem
Produce a full answer, including explanations not just sums, to the following problem: Find the sum of: $$\frac{1}{\sqrt{1}+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \text{and so on up to} + \frac{1}{\sqrt{99}+\sqrt{100}}.$$ What other similar sums lead to an exact whole number answer? <u>Hint:</u> Rationalise the denominator.	In a multiplicagon, the number on each edge of the triangle is the product of the numbers at the adjacent vertices. (The blue squares multiply together to give the surd between them). Can you work out the numbers that belong in the circles to make this multiplicagon correct? $-6 + 2\sqrt{2}$ $7 + 7\sqrt{2}$ $2 - 4\sqrt{2}$
The Babington Plot	**GCSE Recap Poster**
Research and produce a report on the Babington Plot. You must mention the Caesar Cipher, Frequency Analysis and Mary Queen of Scots. Show an example of a code that you have cracked using the cipher and produce a coded message of your own.	Produce a poster to recap the 2 main topics of GCSE Maths that you will need to know in order to fully understand A-level. These are: • Everything about triangles. • Solving quadratic equations.

The two parts will be graded A-E. In part one we will be looking for the correct answers. In part two we will be looking for quality of communication of Mathematics. Good Luck!