Kimberley College

Preparation for Further Maths

You summer task is to research the three areas of maths listed below and answer some questions on these topics. All of the questions are written to be very straight forward if you have managed to research the techniques, they are not designed to trick you.

The areas we would like you to research are:

1. Differentiation – AS Maths – Core Pure 1
2. Integration – AS Maths – Core Pure 1
3. Matrices – AS Further Maths – Further Core 1

Below you will find a list of websites that have materials that will support you in your research. Of course you may use other resources if you so wish.

**Useful Websites**

[www.drfrostmaths.com](http://www.drfrostmaths.com)

[www.mathsgenie.com](http://www.mathsgenie.com)

[www.examsolutions.net](http://www.examsolutions.net)

**1. Differentiation (Core Pure 1 – AS Maths)**

Describe what the derivative of a function/equation tells us?

**a) Basic Differentiation**

i) y = 7x3 + 4x2 – 8x + 12 , find .

ii) f(x) = , find f`(x)

**b) Equations of tangents**

A curve C has equation y = x2 – 6x + 9. Point P is at (5,4) and lies on the curve C.

i) Find the equation of the tangent to curve C at the point (5,4)

ii) Find the equation of the normal to the curve at pint

**c) Stationary Points**

The curve y = x3 + 2x2 – 15x + 17 has two stationary points.

i) Find the coordinates of these stationary points.

ii) State whether the stationary points are local maximums or minimums.

**2) Integration (Core Pure 1 – AS Maths)**

What is the relationship between integration and differentiation?

**a) Basic integration**

i) Find

ii) f`(x) = 2x – 5 + , find f(x).

**b) Integration between limits**

i) Evaluate

ii) What does integration of y, with respect to x, between two limits, find?

**3. Matrices (Further Core 1 – AS Further Maths)**

**a) Calculations with matrices**

i)

ii) 4

iii)

**b) Inverse matrices**

i) Find the determinant of

ii) Find the invers of

ii) Find