A level Mathematics

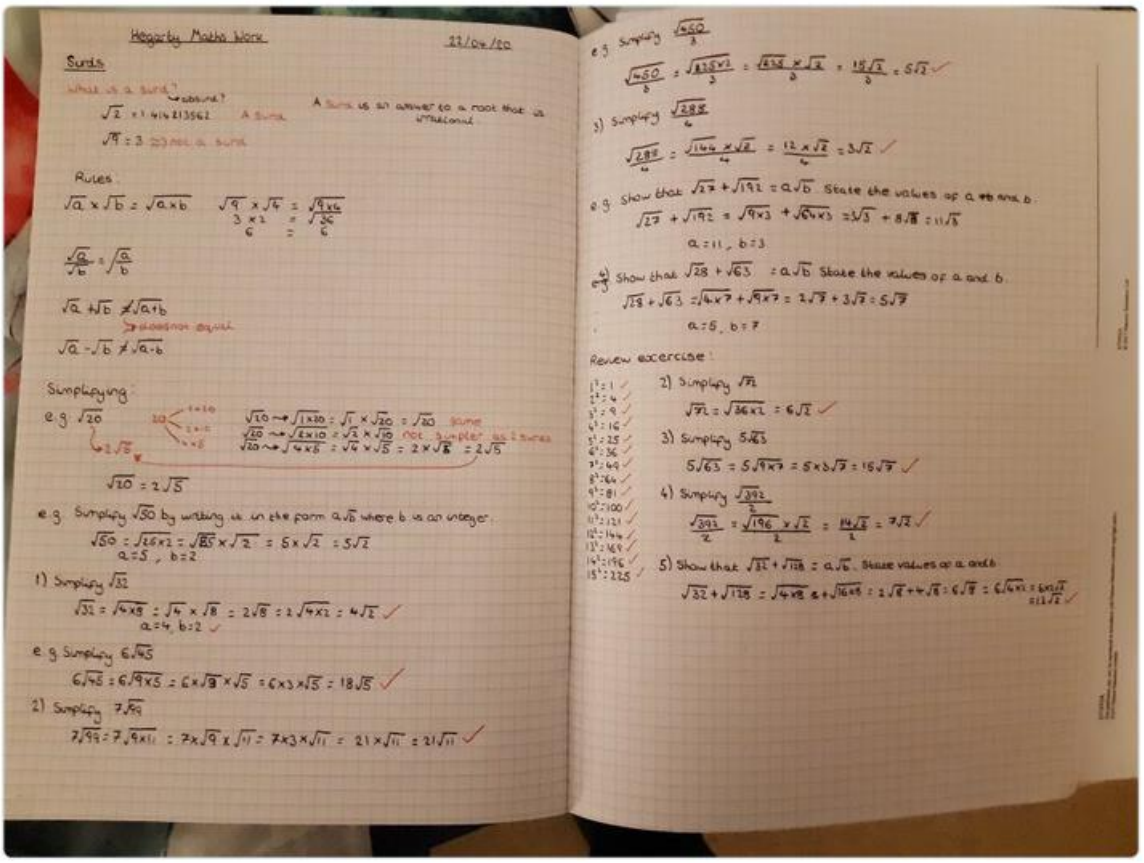
Transition Work

The best thing you can do to prepare for A level Maths is practise the skills and techniques you learnt in Higher level GCSE. If you work through the topics suggested below, watching the videos and trying the questions fully, you will be able to make a good start to the A level course in September.

As a school we have subscribed to a website called Hegarty Maths, and you will be given a login for this site once you officially sign up for A level Maths. Mr Hegarty has made some year 11 Transition videos which are available on YouTube. To prepare for next year we would like you to use some of these videos.

It is really important that you don't just watch the videos, you need paper and a pen with you as you go through them. A notebook to work in that would be helpful, otherwise please work on paper and keep it organised neatly. There are worked examples to watch and then questions for you to try for yourself. Once you have tried each question the answer will be shown so you can see if you got it correct – a pen of a different colour might be useful for you to make notes and do corrections. At the end of each video there is a review exercise to do and the answers to this are given as well.

Example of student work from the live lessons



There is a set of 26 videos, and the link to all the videos is here:

https://www.youtube.com/playlist?list=PLxHVbxhSvleR5tntP2FxYBJCoY5-pD_Z8

We are not expecting you to work through all 26 videos, we would like you to concentrate on the following:

Lesson 1: Simplifying surds

Lesson 2: Expanding brackets with surds

Lesson 5: Laws of indices (1)

Lesson 6: Laws of indices (2)

Lesson 9: Manipulating powers (1)

Lesson 14: Exponential equations (1)

Lesson 18: Gradient of a line (1)

Lesson 20: Equation of a line (1)

In addition to this we would like you to have a go at the questions shown on the next page. Try them all but don't worry if there are some you are unsure about. This will give us a good idea of what you know already and help us give support with any topics you need to revisit in more detail.

Have a great Summer. We are looking forward to seeing you in September.

<u>Skills Check</u> (please bring these questions to your first lesson)

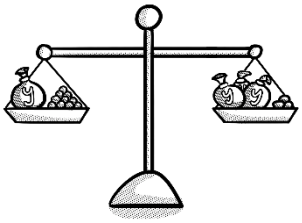
1. Expand the brackets $(2x - 4)(-4 + x)$

2. Given $f(x) = x^2 + 5x - 2$ find the value of $f(4)$

3. Solve the simultaneous equations.

$$3x - 4y = 20$$
$$5x + 5y = 10$$

4. Solve each of these equations.



(i) $4x - 3 = 15$

(ii) $\frac{y}{3} + 4 = 9$

(iii) $5m - 8 = 2m + 13$

5. Simplify $(3 + \sqrt{2})(3 - \sqrt{2})$

6. Simplify $\frac{(x^2y^3z)^5}{4y^2z}$

7. A (0,2), B (7,9) and C (6,10) are three points.

(i) Find the gradients of AB and AC.
(ii) Explain how you can tell that AB and BC are perpendicular.
(iii) Find the length of AC.

8. Sketch the graph of

(i) $y = x^2$
(ii) $y = x^2 + 2$
(iii) $y = (x - 3)^2$
(iv) $y = -x^2$

9. Without using a calculator solve

(i) $x^2 = 9$
(ii) $x^2 + 2x - 35 = 0$
(iii) $2x^2 + 7x + 3 = 0$
(iv) $x^2 + 5x - 2 = 0$

10. Solve

    (i) $4(3x + 9) < 50$

    (ii) $x^2 - 36 \leq 0$

11. Prove that the square of an odd number is also odd.

12. Caleb either walks to school or travels by bus. The probability that he walks to school is 0.75

    If he walks to school, the probability that he will be late is 0.3 If he travels to school by bus, the probability that he will be late is 0.1 Work out the probability that he will not be late.

Problem Solving

1. Two numbers have a product of 44 and a mean of 7.5

   Use an algebraic method to find the numbers.

   You must show all your working.

2. Sarah intended to spend exactly £6.00 on prizes for her class but each prize cost her 10p more than expected, so she had to buy 5 fewer prizes.
   Calculate the cost of each prize.

3. Arthur and Florence are going to the theatre.
   Arthur buys 6 adult tickets and 2 child tickets and pays £39.
   Florence buys 5 adult tickets and 3 child tickets and pays £36.50
   Work out the costs of an adult ticket and a child ticket.

4. Colin has handed in this question in his 'simplifying surds' homework. Explain how he should improve his work.

$$4\sqrt{3} \times 5\sqrt{12} = 20\sqrt{36}$$