

A level Maths Induction Work Summer 2022

The A level Maths transition work is set on an online learning platform called Integral. This is an online resource that you will use a lot during your A level Maths studies. The videos, activities and assessments in this work will review key ideas from GCSE Maths whilst also starting to look at things from an A level Maths viewpoint.

We are asking you to complete the **Surds & Indices** and **Algebraic Manipulation** sections, but we highly recommend that you work through some of the other sections as well to give yourself the best preparation for A level Maths. As part of the induction process there will be a short test in one of your maths lessons in the week of the 5th September, your teachers will confirm the exact date on the enrolment day in September. This test is based on key skills from GCSE Maths. A practice test is included at the end of this document – the real test is very similar.

Please bring your marked practice test to your induction lesson on 2nd September. Your teachers can offer support on any aspects you have struggled with ahead of the actual test the following week.

We expect students to get at least 70% in the induction test (80% for those doing Further Maths)

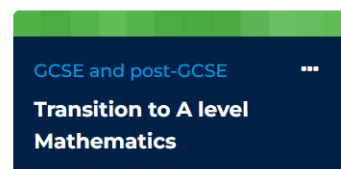
Accessing the resources

To access the resources go to <https://integralmaths.org/>.

Your login will be 897T- followed by your first initial and surname. For example, someone called Sam Jones would have the login 897T-sjones. Your password is initially the same as your username. Accounts have been created based on the names from the July induction day. If your account does not exist yet please email Mr Cobb pxc@hardenhuish.wilts.sch.uk to have one created. *Note - if your surname has a space or hyphen in it, please omit this – for example Alex Rain-Wind would become 897T-arainwind*

Once logged in select “Transition to A level Mathematics”

You will then see a welcome message, and an introduction video which you need to watch before the materials become available.



There are seven sections of the course, but we are only asking you to complete **Surds & Indices** and **Algebraic Manipulation** sections. Please work through the interactive videos before attempting the assessment. If you wish you can explore the “Going Deeper” materials or work through some of the other sections.

Integers

Geometry

Surds and indices

Coordinate geometry

Algebraic manipulation

Trigonometry

Completing the square

Screenshots of the course pages

Welcome

Well done for choosing A level Maths. It's a great choice for your future. Whatever you end up doing after A levels it's likely to need some maths or quantitative skills. Maths is the most popular A level and more than 95 000 young people start it every year, so you are in good company.

The course is designed to prepare and support you as you begin your journey into A level Mathematics and, for some of you, A level Further Maths.

The course materials will appear on this page once you have watched the 3 minute introduction video. When you are ready click on the link below.


 [Introduction video](#)




Outline of Surds and Indices section

Surds and indices


 [Surds and indices 1: Introduction](#)

 [Surds and indices 2: Manipulating surds](#)

Restricted Not available to students unless: The activity [Surds and indices 1: Introduction](#) is marked complete (hidden otherwise)

 [Surds and indices 3: Doing more with indices](#)

Restricted Not available to students unless: The activity [Surds and indices 2: Manipulating surds](#) is marked complete (hidden otherwise)

 [Surds and indices 4: Doing more with surds](#)

Restricted Not available to students unless: The activity [Surds and indices 3: Doing more with indices](#) is marked complete (hidden otherwise)

Assessment

You only get one attempt at the assessment, so make sure you've covered all the material above before you start it.

 [Surds and indices assessment](#)



Outline of Algebraic Manipulation section

Algebraic manipulation

From GCSE to A level

This topic contains 4 chapters. When you have completed each chapter, tick the box on the right of the page, and the next chapter will appear.

 [Algebraic manipulation 1: Algebra is all about numbers](#)

 [Algebraic manipulation 2: Factorising](#)

Restricted Not available to students unless: The activity [Algebraic manipulation 1: Algebra is all about numbers](#) is marked complete (hidden otherwise)

 [Algebraic manipulation 3: Simultaneous equations](#)

Restricted Not available to students unless: The activity [Algebraic manipulation 2: Factorising](#) is marked complete (hidden otherwise)

 [Algebraic manipulation 4: Inequalities](#)

Restricted Not available to students unless: The activity [Algebraic manipulation 3: Simultaneous equations](#) is marked complete (hidden otherwise)

Assessment

You only get one attempt at the assessment, so make sure you've covered all the material above before you start it.

 [Algebraic manipulation assessment](#)



Practice Test

Your test will ask similar questions to this one. Answers are on the following page.

You may NOT use a calculator

1. Expand and simplify

(a) $4x(3x - 2) - x(2x + 5)$ (b) $(2x + 3)(2x - 1)$ (c) $(a - 12)^2$

2. Factorise

(a) $x^2 - 7x$ (b) $x^2 + 9x - 36$ (c) $y^2 - 64$ (d) $25y^3 - 9y$

3. Simplify

(a) $\frac{4x^3y}{8x^2y^3}$ (b) $\frac{3x+2}{3} + \frac{4x-1}{6}$

4. Solve the following equations

(a) $\frac{h-1}{4} + \frac{3h}{5} = 4$ (b) $x^2 - 8x = 0$ (c) $k^2 - 7k - 18 = 0$ (d) $p^2 + 4p = 12$

5. Write each of the following as single powers of x and/or y

(a) $\frac{1}{x^4}$ (b) $(x^2y)^3$ (c) $\frac{x^5}{x^{-2}}$

6. Work out the values of the following, giving your answers as fractions where appropriate

(a) 4^{-2} (b) 10^0 (c) $\left(\frac{8}{27}\right)^{\frac{1}{3}}$

7. Solve the simultaneous equations

$$\begin{aligned} 3x - 5y &= -11 \\ 5x - 2y &= 7 \end{aligned}$$

8. Rearrange the following equations to make x the subject

(a) $v^2 = u^2 + 2ax$ (b) $V = \frac{1}{3}\pi x^2h$ (c) $y = \frac{x+2}{x+1}$

9. Solve $x^2 + 4x + 1 = 0$, giving your solutions in surd form

10. Solve $5x^2 - x - 1 = 0$, giving your solutions in surd form

ANSWERS TO PRACTICE TEST

1) a) $10x^2 - 13x$ b) $4x^2 + 4x - 3$ c) $a^2 - 24a + 144$

2) a) $x(x-7)$ b) $(x+12)(x-3)$ c) $(y+8)(y-8)$ d) $y(5y-3)(5y+3)$

3) a) $\frac{x}{2y^2}$ b) $\frac{10x+3}{6}$

4) a) $h=5$ b) $x=0$ or $x=8$ c) $k=9$ or $k=-2$ d) $p=-6$ or $p=2$

5) a) x^4 b) x^6y^3 c) x^7

6) a) $\frac{1}{16}$ b) 1 c) $\frac{2}{3}$

7) $x=3, y=4$

8) a) $x = \frac{v^2 - u^2}{2a}$ b) $x = \pm \sqrt{\frac{3V}{\pi h}}$ c) $x = \frac{2-y}{y-1}$

9) $x = \frac{-4 \pm \sqrt{12}}{2}$ ($= -2 \pm \sqrt{3}$)

10) $x = \frac{1 \pm \sqrt{21}}{10}$