

# WEST COVENTRY SIXTH FORM



SUBJECT TRANSITION BOOK  
Summer 2019

Further Mathematics

# STUDENT NAME:

## Form:

This booklet has been prepared by maths staff for you to read and the work contained in it will ensure that you get off to the best possible start in this subject area. It is very important that you read this booklet carefully and have a thorough attempt to complete the work and submit it to your subject teacher in the very first lesson. This will be the first impression you create and is a real indicator of how seriously you are prepared to be in your studies. For Further Mathematics it is **vital that the Mathematics transition booklet is completed fully and all the topics in it are fully understood**. This will be a basis for many topics in Further Maths.

### A-Level Further Mathematics

#### The key staff are:

Mrs Woodward – Curriculum Leader of Maths, <a href="mailto:staffjaw@westcoventryacademy.org">staffjaw@westcoventryacademy.org</a>
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Mr Dahal - Key Stage 5 Coordinator of Maths, <a href="mailto:staffPDD@westcoventryacademy.org">staffPDD@westcoventryacademy.org</a>
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### Course Details

**Course Title:** A Level Further Mathematics

**Exam board:** Edexcel

**Exam Code:** For AS Further Mathematics 8FM0

For A Level Further Mathematics 9FM0

**Exam Board web site:** [qualifications.pearson.com](http://qualifications.pearson.com)

**Assessment method:** AS level Further Mathematics is assessed by two exams in year 12, this will not count towards the full A Level. The A Level Further Mathematics is assessed by four final exams in year 13.

**Minimum requirement:** Standard entry requirements of five A\*-C grades (or equivalent 9-1 grades) including English language, along with Mathematics at Grade 8 or above.

#### About the course

Further Mathematics is a challenging academic course that is designed to stretch students understanding of some familiar concepts whilst introducing some abstract mathematical concepts. Students will learn subject content alongside their Mathematics course and will at times need to apply the A Level Mathematics knowledge in different, more complex problems. The Decision element of Further Mathematics introduces students to the basis of logistics and the theory behind computer programming. For a mathematically able student, the course allows them to think beyond the textbook and explore mathematical ideas that are used widely in physics, engineering and computer gaming. Algebra skills are required to be at a high level and students must be especially confident in factorising.

## AS Further Mathematics

**Core Pure Mathematics – One 1 hour 40-minute Exam paper.** Topics included are: Proof, Complex Numbers, Matrices, Further Algebra and Functions, Further Vectors and Further Differentiation and Integration.

**Further Mathematics Option K - One 1 hour 40-minute Exam paper.** This currently includes Decision Mathematics 1 and 2. Other available options include Further Pure Mathematics, Further Statistics, or Further Mechanics. The option content will be confirmed in September.

## A Level Further Mathematics

**Core Pure Mathematics 1 and 2 – Two, 1 hour 30-minute Exam papers.** Topics included are: Proof, Complex Numbers, Matrices, Further Algebra and Functions, Further Vectors and Further Differentiation and Integration, Differential Equations, Polar Coordinates and Hyperbolic Functions

**Further Mathematics Option K - Two, 1 hour 30-minute Exam papers.** This currently includes Decision Mathematics 1 and 2. Other options include Further Pure Mathematics, Further Statistics, or Further Mechanics. The option content will be confirmed in September.

## Academic and Career Pathways

Further Mathematics provides you with the skills required to study at a higher level whilst also developing logical problem solving skills that will be useful in the work place. Students who have studied Further Mathematics have boosted their Mathematics A Level grade and found the subject useful when they are studying Mathematics at university. It also has applications in applied subjects such as Engineering, Physics and Economics. Students in the past have followed a wide range of pathways including university, training schemes, employment and have found that the combination of Mathematics and Further Mathematics A Level is well regarded by employers.

## What equipment will be needed for the subject?

An A4 ring binder, with dividers

Lined paper

Pens, pencils, ruler

A scientific calculator. We recommend the new Casio Classwiz fx-991EX.

PLEASE CONSULT WITH THE MATHS DEPARTMENT BEFORE BUYING ANY OTHER MODEL.

## Text Books

Students are required to hand in a refundable deposit of £10 for each of the three text books needed for AS Further Maths and £10 deposit for the one AL book. The deposit will be returned to the students on return of the text books in a reusable condition.

**In addition to the Mathematics Transition Booklet, please complete the following assignment ready to hand in on the very first lesson in this subject:**

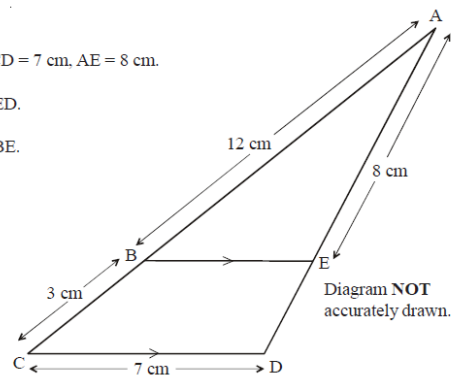
**Algebra**

- 1) Factorise  $3x^2 + 4x - 15$
- 2) Factorise  $9x^2 - 16$
- 3) Solve  $x^2 - 81 = 0$
- 4) Solve by completing the square  $2x^2 + 6x - 21 = 0$
- 5) Use the formula to solve  $4x^2 + 6x - 5 = 0$
- 6) Solve the simultaneous equations  $2x - 3y = 6$  and  $xy = 12$
- 7) Solve the simultaneous equations  $2x^2 + y^2 = 9$  and  $x + y = 3$
- 8) Given that  $x=2$  is a solution to  $x^3 - 2x^2 - 3x + 6 = 0$ , find the other solutions

**Similarity**

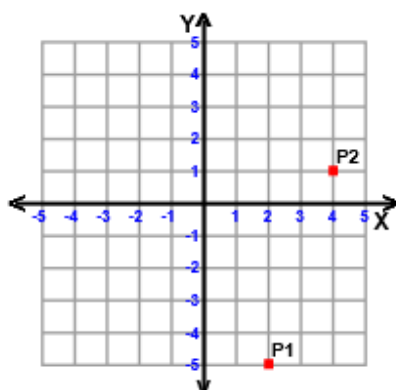
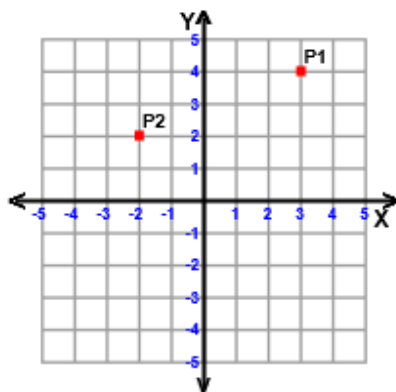
- 1) BE is parallel to CD.  
AB = 12 cm, BC = 3 cm, CD = 7 cm, AE = 8 cm.

- a) Calculate the length of ED.
- b) Calculate the length of BE.



**Pythagoras**

Find the distance between the two points



### Indices and surds

1)  $(-d^4)^3$

2)  $8^{-2/3}$

3)  $(0.04)^{1/2}$

4)  $\left(\frac{1}{16}\right)^{-3/2}$

5)  $2a^{1/2} \times 3a^{5/2}$

6)  $(x^2y^4)^{1/2}$

7)  $\frac{1}{\sqrt{3}-1}$

8)  $\frac{4}{\sqrt{6}-2}$

9)  $\frac{7}{\sqrt{7}-2}$

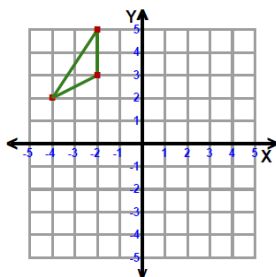
10)  $\frac{-3}{\sqrt{5}+1}$

11)  $\frac{\sqrt{3}-1}{\sqrt{5}}$

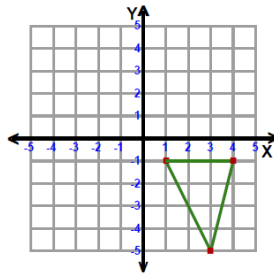
12)  $\frac{\sqrt{5}-1}{\sqrt{5}+3}$

### Transformations

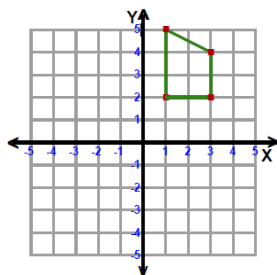
Reflection: Across the x-axis



Reflection: Across Line  $y = -x$



Rotation:  $90^\circ$  clockwise about the origin



Rotation:  $180^\circ$  about the origin

