



St Dominic's is a Roman Catholic Sixth Form College committed to the personal and spiritual growth of all its members based on Christian values, academic excellence and high-quality pastoral care

St Dominic's Sixth Form College
Further Mathematics Transition work 2022-23

Introduction

'I felt so lost. Everyone else in my class had done it before'. There are always some students who feel like this, so we have assembled material which some students feel more familiar with than others. We know you have worked hard for your GCSEs, but we would like you to spend 3 hours sometime between now and September attempting these questions. Use textbooks, online resources, clever friends as much as you like (so long as they don't do it for you!).

If you make a serious attempt at this you will have a much better chance of starting the course on a level playing field.

You must hand this work in at your first Maths/Further Maths lesson.

You will need the following equipment for your Maths/Further Maths lessons:

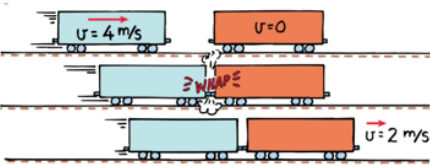
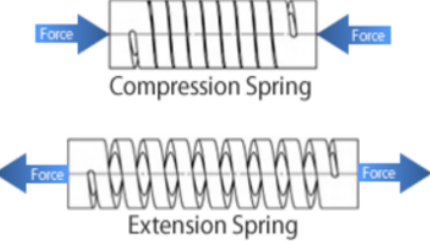
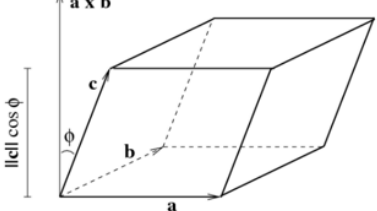
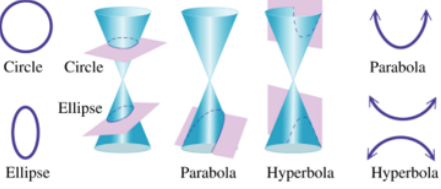
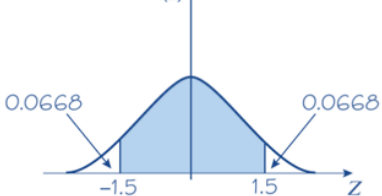
- Pen, pencil, ruler, eraser
- A4 lined paper
- A4 folder
- CASIO fx-991EX Classwiz calculator **or** CASIO fx-CG50 Graphical calculator

You will be provided access to Online Textbooks for use outside of lessons.

For more details about the course, please refer to the department handbook on Sharepoint after you have enrolled at the college.

Information about Further Maths

All Further Maths students must take: **CP1**, **CP2**, **FS1** and an option module. Here is a brief introduction to the 3 option modules we offer at St Dominic's to help you make a decision when you enrol in September.

FM1	FP1	FS2																																																							
<p>Collisions</p>  <p>Springs</p>  <p>Momentum Work, Power and Energy</p>	<p>Vectors</p>  <p>Conic Sections</p>  <p>Inequalities Taylor Series Reducible Differential Equations Methods in Calculus</p>	<p>Estimation, confidence Intervals</p>  <p>Correlation</p> <table border="1" data-bbox="1037 884 1476 1108"> <thead> <tr> <th colspan="6">Product moment coefficient</th> </tr> <tr> <th></th> <th colspan="5">Level</th> <th rowspan="2">Sample size</th> </tr> <tr> <th></th> <th>0.10</th> <th>0.05</th> <th>0.025</th> <th>0.01</th> <th>0.005</th> </tr> </thead> <tbody> <tr> <td>0.8000</td> <td>0.9000</td> <td>0.9500</td> <td>0.9800</td> <td>0.9900</td> <td>4</td> </tr> <tr> <td>0.6870</td> <td>0.8054</td> <td>0.8783</td> <td>0.9343</td> <td>0.9587</td> <td>5</td> </tr> <tr> <td>0.6084</td> <td>0.7293</td> <td>0.8114</td> <td>0.8822</td> <td>0.9172</td> <td>6</td> </tr> <tr> <td>0.5509</td> <td>0.6694</td> <td>0.7545</td> <td>0.8329</td> <td>0.8745</td> <td>7</td> </tr> <tr> <td>0.5067</td> <td>0.6215</td> <td>0.7067</td> <td>0.7887</td> <td>0.8343</td> <td>8</td> </tr> <tr> <td>0.4716</td> <td>0.5822</td> <td>0.6664</td> <td>0.7498</td> <td>0.7977</td> <td>9</td> </tr> </tbody> </table> <p>Hypothesis Testing Continuous Distribution T-Distribution</p>	Product moment coefficient							Level					Sample size		0.10	0.05	0.025	0.01	0.005	0.8000	0.9000	0.9500	0.9800	0.9900	4	0.6870	0.8054	0.8783	0.9343	0.9587	5	0.6084	0.7293	0.8114	0.8822	0.9172	6	0.5509	0.6694	0.7545	0.8329	0.8745	7	0.5067	0.6215	0.7067	0.7887	0.8343	8	0.4716	0.5822	0.6664	0.7498	0.7977	9
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<p>Good for Engineering and Physics degrees</p>	<p>Good for Mathematics degree</p>	<p>Good for Economics and Finance related degrees</p>																																																							

Watch [this video](#) to give you a better idea about the demands of Further Maths and the modules, we suggest you do some reading around these to also aid your decision. We will provide you more information once you start in September as well as access to all the textbooks. You will have a few weeks to change your option module choice, so do not worry if you are uncertain even after doing the research.

Regardless of your choice please complete the transition work below. Have a great summer and we look forward to seeing you all in September.

Transition work for Further Maths Students

Please try the question yourself first before clicking the link for the full worked solution

Q1 challenge level 1

Tummy Ache

Timmy, Tammy and Tommy all set off separately to visit their doctor, leaving their homes at exactly the same time.

Timmy cycles the 8 km at an average speed of 20 km/hr.

Tammy walks the 1.2 km at an average speed of 4 km/hr.

Tommy drives the 16.5 km at an average speed of 45 km/hr.

In what order do they arrive at the doctor's surgery?

<https://nrich.maths.org/2408/solution>

Q2 challenge level 2

Crude Calculation

When Louise had her first car, 50 litres of petrol cost £40. When she filled up the other day, she noticed that 40 litres of petrol cost £50.

By what percentage has the cost of petrol increased over this time?

<https://nrich.maths.org/12536/solution>

Q3 challenge level 2

The Power of X

Find the value of X, where

$$2^{x+1} - 2^{x-1} = 12$$

<https://nrich.maths.org/13228/solution>

Q4 challenge level 2

Diagonal Area

A square has area 72 cm². Find the length of its diagonal.

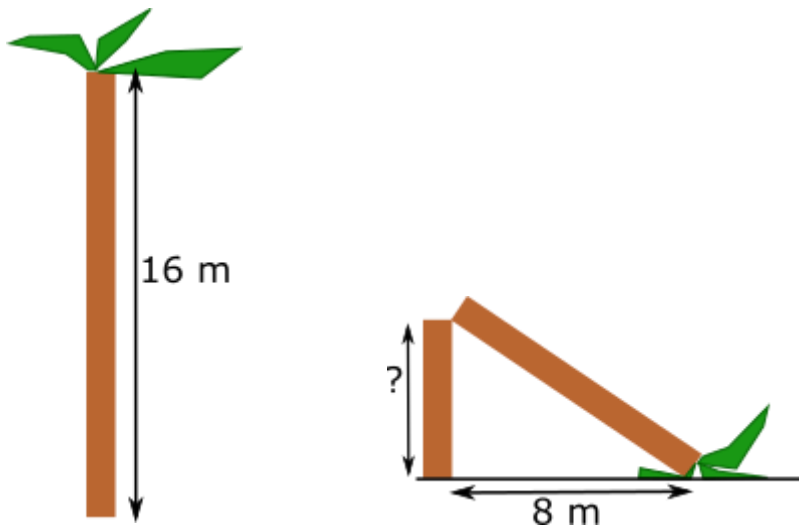
<https://nrich.maths.org/13224/solution>

Q5 challenge level 2

Snapped Palm Tree

A palm tree that was 16 metres tall has snapped in a storm, so that the top of the palm tree has landed 8 metres from the base.

What is the height of the piece of the trunk that is still standing (vertically)?



<https://nrich.maths.org/12784/solution>

Q6 challenge level 2

Turnips

Baldrick can afford to buy either 6 parsnips and 7 turnips, or 8 parsnips and 4 turnips.

Both options leave him with no change.

If he only bought turnips, how many could he afford?

<https://nrich.maths.org/2051/solution>

Q7 challenge level 2

Acceptance Rate

The mean number of students accepted by a school in the four years 2007 to 2010 was 325.

The mean number of students accepted by the school in the five years 2007 to 2011 was 4% higher.

How many students did this school accept in 2011?

<https://nrich.maths.org/12588/solution>

Q8 challenge level 2

Odd Dice

Three fair, six-sided dice are numbered as follows:

A: 1, 1, 1, 2, 2, 2

B: 3, 3, 4, 4, 5, 5

C: 6, 7, 7, 8, 8, 8

The three dice are rolled once. What is the probability that the sum obtained is an odd number?

<https://nrich.maths.org/13666/solution>

Q9 challenge level 2

One or Both

A maths exam contained only two questions. Every pupil correctly answered at least one of the questions.

Question one was correctly answered by 70% of the pupils. Question two was correctly answered by 60% of them.

Nine pupils correctly answered both questions.

How many pupils took the exam?

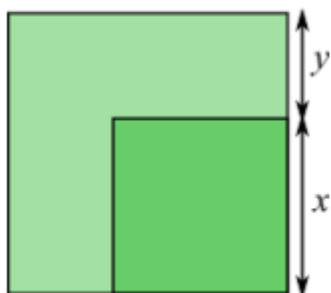
<https://nrich.maths.org/794/solution>

Q10 challenge level 3

A Third of the Area

In this diagram, the area of the small square is $\frac{1}{3}$ of the area of the large square.

Find $\frac{x}{y}$.



<https://nrich.maths.org/13546/solution>