

# The Mathematics Diagnostic Test

## Mock Test and Further Information 2010

In welcome week, students will be asked to sit a short test in order to determine the appropriate lecture course, tutorial group, whether they appear to be underachieving on any particular topic and also to gauge the general mathematical profile of the group.

This test should **NOT** be seen as daunting in any sense.

We have found that many students wish to see a 'mock' test and other associated material. The resources mentioned below are provided on the following pages.

Pages 2-8	Mock Diagnostic Test
Page 9	Answers to Questions in Diagnostic Test
Pages 10-14	References to topics for similar Questions
Page 15	Electronic Questions on these topics

If you have any questions regarding this mock test, the diagnostic process, the transition to University mathematics etc, please contact

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# *MOCK VERSION*

## Mathematics Diagnostic Test 2010

This test exists to provide a profile of your mathematical strengths and weaknesses. Depending on your school, it may be used to assign you to a particular mathematics course or tutorial group or to determine whether you need to revise a particular topic. This test does NOT produce a mark for assessment.

Please use the minutes before the official start of the test to enter your details on the official answer sheet. Please write your name and ID number and tick the boxes for your school and for previous maths qualifications etc.

The test will last for 80 minutes. There are 48 multiple-choice questions with up to 8 potential answers. You should enter ONE answer for each question. In case of time-pressure, please concentrate on sections A to H i.e. questions 1 to 32.

Calculators : Only single line or double line, non-graphical calculators WITHOUT the ability to carry out calculus may be used. The Casio fx570 is specifically disallowed.

For ALL questions, note the following for choices A and B

A	I have not seen this material before
B	I have seen this before but I have forgotten

In case of any questions, please contact the invigilators.

At the end of the test, please hand the question paper and the answer paper to the invigilators.

# *MOCK VERSION*

Section A

- A1. If  $y^9 \div y^4 = y^n$  which is the value of  $n$ .
- A2. Solve the equation  $5x + 11 = 36$  and give the value for  $x$ .
- A3. Solve the simultaneous equations and give the value for  $x$ .

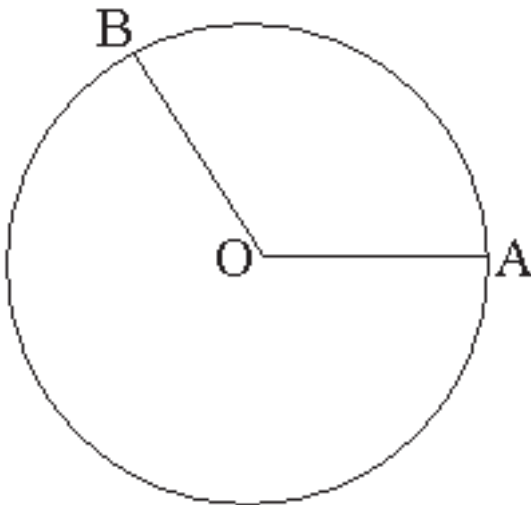
$$\begin{aligned} 3x - y &= -6 \\ 4x + 2y &= 2 \end{aligned}$$

- A4. If  $y = \frac{7}{x+2} - 1$ , which of the following is an expression for  $x$  ?

	C	D	E	F	G	H
A1	2.25	5	6.75	13	36	Some other answer
A2	1	2	3	4	5	Some other answer
A3	-2	-1	0	1	2	Some other answer
A4	$\frac{7}{y+1} + 2$	$\frac{7}{y+1} - 2$	$\frac{7}{y-1} + 2$	$\frac{7}{y-1} - 2$	$-\frac{7}{y+1} - 2$	Some other answer

Section B

- B5. To how many degrees does  $\pi/5$  radians correspond ?



- B6. In the circle above, if angle AOB is 2 radians and the length of OA is 3 units, what is the area of the minor sector AOB.

- B7. If  $\sin \theta = \frac{1}{2}$  and  $\frac{5\pi}{2} < \theta < 4\pi$ , what is the value of  $\theta$  ?

- B8. Simplify  $\sin\left(\frac{3\pi}{2} + \theta\right)$

	C	D	E	F	G	H
B5	30	36	48	60	72	Some other answer
B6	2	$\pi$	6	$6\pi$	$9\pi$	Some other answer
B7	$\pi/6$	$5\pi/6$	$13\pi/6$	$17\pi/6$	$25\pi/6$	Some other answer
B8	$\sin \theta$	$-\sin \theta$	$\cos \theta$	$-\cos \theta$	$\sin \theta - \frac{3}{2}\pi$	Some other answer

Section C

C9. In the sequence  $u_n = \frac{1}{2} \frac{n}{n+3}$ , what is the value of  $u_5$  ?

C10. In an arithmetic sequence, the third term is 7 and the constant difference is 4. What is the eighth term ?

C11. What is the sum of the first 12 terms of the arithmetic series  $5 + 3 + 1 - 1 - 3 - \dots$  ?

C12. What is (to three decimal places) the sum to infinity of the series  $4 + \frac{8}{5} + \frac{16}{25} + \frac{32}{125} + \dots$

	C	D	E	F	G	H
C9	$\frac{1}{5}$	$\frac{5}{16}$	$\frac{5}{13}$	$\frac{5}{2}$	5	Some other answer
C10	23	24	27	28	42	Some other answer
C11	-72	-61	0	5	72	Some other answer
C12	4	6.496	6.667	7.5	8.333	Some other answer

Section D

D13. If  $f(x) = x^2 - 5x + 9$ , find  $f(6)$ .

D14. If  $f(x) = x + 5$  and  $g(y) = 3y - 7$ , which option is the combined function  $g(f(x))$  ?

D15. If a function is defined by  $y = f(x) = \frac{2}{x-3} + 1$ , find the inverse function

D16. If  $f(x) = |x + 2| - 1$ , what is  $f(-4)$  ?

	C	D	E	F	G	H
D13	5	12	15	21	36	Some other answer
D14	$3xy - 7x + 15y - 35$	$3x^2 + 8x - 35$	$x + 3y - 2$	$3x - 2$	$3x + 8$	Some other answer
D15	$\frac{3x+5}{x-1}$	$\frac{2}{x+1} - 3$	$\frac{2}{x-1} + 3$	$\frac{2}{x-3}$	$\frac{x}{2}$	Some other answer
D16	-3	-1	1	3	5	Some other answer

Section E

E17. Which option equals  $(x - 3)(x^2 + 1)$

E18. The quadratic equation  $2x^2 - 3x - 20 = 0$  has a negative root and a positive root. Which of the following is the positive root ?

E19. Find the coefficient of  $x^3$  in the expansion of  $(x - 2)^5$

E20. What is the remainder when  $x^2 + 2x + 5$  is divided by  $x - 3$  ?

	C	D	E	F	G	H
E17	$x^2 + 2x - 3$	$x^2 - 2x + 3$	$x^2 - 2x - 3$	$x^3 - 3x^2 + x - 3$	$x^3 + 3x^2 - x - 3$	Some other answer
E18	0	1	2	3	4	Some other answer
E19	-20	-10	-2	10	20	Some other answer
E20	-10	-5	0	5	10	Some other answer

Section F

F21. Find  $x$  if  $\log_2 8 = x$  [Hint :-  $8 = 2 \times 2 \times 2$  ]

F22. If  $\log_a x = p$  and  $\log_a y = q$ , what is  $\log_a x^3 y$  ?

F23. If  $x = e^{2z}/y^2$  , express  $z$  as a function of  $x$  and  $y$  .

F24. By taking logarithms, solve  $5^x = 61$ . In which range does  $x$  lie ?

	C	D	E	F	G	H
F21	2	3	16	64	256	Some other answer
F22	$(p + 3q) \log a$	$3pq$	$q^3 q$	$p^3 + q$	$3p + q$	Some other answer
F23	$\frac{xy^2}{2e}$	$\frac{\ln(xy^2)}{2e}$	$\ln x + \ln y$	$\frac{1}{2} \ln(xy^2)$	$\frac{1}{2} \ln x \ln y^2$	Some other answer
F24	$2.2 < x \leq 2.3$	$2.3 < x \leq 2.4$	$2.4 < x \leq 2.5$	$2.5 < x \leq 2.6$	$2.6 < x \leq 2.7$	Some other answer

Section G

G25. Which of the following is the derivative (with respect to  $x$  ) of  $3x^2$

G26. At what value of  $x$  does the function  $y = 2x^2 - 12x + 3$  have a minimum

G27. Which of the following is the derivative (with respect to  $x$  ) of  $5 \ln x$

G28. Which of the following is the derivative (with respect to  $x$  ) of  $(2x - 1)^8$

	C	D	E	F	G	H
G25	$6x^2$	$9x^2$	$3x$	$6x$	$9x$	Some other answer
G26	$\frac{2}{3}$	2	3	4	12	Some other answer
G27	$4 \ln x$	$\ln x^5$	$5 \ln$	$5x \ln x - 5x$	$\frac{5}{x}$	Some other answer
G28	$2(2x - 1)^7$	$8(2x - 1)^7$	$16(2x - 1)^7$	$7 \times 2^7$	$8 \times 2^7$	Some other answer

Section H

H29. Which of the following is the integral (with respect to  $x$  ) of  $8x^3 - 2x$ . Consider all answers to have a '+C' at the end.

H30. Which of the following is the integral (with respect to  $x$  ) of  $5e^x$  . Consider all answers to have a '+C' at the end.

H31. Which of the following is the integral  $\int_1^3 x dx$

H32. What is the area under the curve  $y = x^2 + x$  but above the  $x$ -axis for  $1 \leq x \leq 2$ .

	C	D	E	F	G	H
H29	$2x^4 - x^2$	$4x^4 - 2x^2$	$8x^4 - 2x^2$	$\frac{8}{3}x^3 - 2x$	$4x^3 - 2x$	Some other answer
H30	$5 \ln x$	$5e^{5x}$	$5e^x$	$\frac{5e^x}{x+1}$	$\frac{5e^{x+1}}{x+1}$	Some other answer
H31	2	4	5	8	10	Some other answer
H32	$\frac{1}{2}$	$\frac{5}{6}$	$\frac{14}{3}$	$\frac{11}{4}$	$\frac{23}{6}$	Some other answer

Section I

I33. Which of the following is a simplified version of  $\frac{2x^2 + 2x - 4}{x + 2}$  ?

- C :  $2(x - 1)$       D :  $2(x + 2)$   
 E :  $2x + 1 - 4$     F :  $2x^2 + x - 6$   
 G :  $\frac{x^2 + x - 2}{(x + 2)}$     H : None of the above

I34. If  $\frac{x + 7}{(x - 3)(x + 2)}$  can be expressed in partial fractions as  $\frac{A}{x - 3} + \frac{B}{x + 2}$ , what is the value of  $A$  ?

I35. Which of the following is the most appropriate partial fractions for  $\frac{2x - 7}{(x - 1)(x + 3)^2}$  ?

- C :  $\frac{P}{x - 1} + \frac{Q}{x + 3}$       D :  $\frac{P}{x - 1} + \frac{Q}{x + 3} + \frac{R}{(x + 3)^2}$   
 E :  $\frac{P}{x - 1} + \frac{Q}{(x - 1)^2} + \frac{R}{x + 3}$     F :  $\frac{Px + Q}{x - 1} + \frac{Rx + S}{x + 3}$   
 G :  $\frac{Px + Q}{x - 1} + \frac{Rx + S}{x + 3} + \frac{Tx + V}{(x + 3)^2}$     H : None of the above

I36. In the series expansion in ascending powers of  $x$  for  $(1 - 2x)^{5/2}$ , what is the coefficient of  $x^3$  ?

	C	D	E	F	G	H
I33	C	D	E	F	G	Some other answer
I34	1	2	3	4	5	Some other answer
I35	C	D	E	F	G	Some other answer
I36	-15	$-\frac{5}{2}$	$-\frac{4}{3}$	$-\frac{3}{2}$	$\frac{5}{16}$	Some other answer

Section J

J37. Which of the following is the derivative (with respect to  $x$ ) of  $4 \sin^3 x$

J38. Which of the following is the derivative (with respect to  $x$ ) of  $xe^x$

J39. Which of the following is the derivative (with respect to  $x$ ) of  $\frac{\sin x}{x}$

- C :  $\frac{x \cos x - \sin x}{x^2}$     D :  $\frac{\sin x - x \cos x}{x^2}$   
 E :  $\frac{x \sin x - \cos x}{x^2}$     F :  $\frac{x \sin x - \cos x}{\sin^2 x}$   
 G :  $\frac{x \cos x - \sin x}{\sin^2 x}$     H : None of the above

J40. If  $y + 2x \sin y = e^x$ , find the derivative  $\frac{dy}{dx}$  at the point  $x = 0, y = 1$ . In which range does  $\frac{dy}{dx}$  lie

?

	C	D	E	F	G	H
J37	$12 \sin^2 x \cos x$	$12 \cos^2 x \sin x$	$12 \sin^2 x$	$12 \cos^2 x$	$4 \cos^3 x$	Some other answer
J38	$xe^x$	$xe^x + e^x$	$xe^x - e^x$	$xe^x - e^x + 1$	$\frac{x^2}{2}e^x - e^x$	Some other answer
J39	C	D	E	F	G	Some other answer
J40	-0.7 to -0.6	-0.6 to -0.5	-0.5 to -0.4	-0.4 to -0.3	-0.3 to -0.2	Some other answer

Section K

K41. Which of the following is  $\int \sec^2 3x \, dx$  ?

K42. Using a trigonometric identity, the integral  $\int \sin^2 2x \, dx$  can be shown to equal  $f(x) + \text{trig term} + C$ . Which of the following could  $f(x)$  equal ?

K43. Use the substitution  $u = 2 + \sin x$  to find  $\int_0^{\pi/2} \frac{\cos x}{2 + \sin x} \, dx$ .

In which range does the integral lie ?

K44. Using integration by parts, find  $\int xe^{3x} \, dx$ . Which of the following does it equal ?

- C :  $\frac{1}{3}xe^{3x} - \frac{1}{9}e^{3x} + C$     D :  $\frac{1}{3}xe^{3x} + \frac{1}{9}e^{3x} + C$   
 E :  $xe^{3x} - \frac{1}{3}e^{3x} + C$     F :  $xe^{3x} + \frac{1}{3}e^{3x} + C$   
 G :  $\frac{1}{3}x^2e^{3x} - \frac{1}{9}xe^{3x} + C$     H : None of the above

	C	D	E	F	G	H
K41	$\frac{1}{3} \sec^3 3x + C$	$\frac{1}{9} \sec^3 3x + C$	$\frac{1}{3} \tan^2 3x + C$	$\frac{1}{3} \cot^2 3x + C$	$\frac{1}{3} \tan 3x + C$	Some other answer
K42	2	$\frac{x}{2}$	$\frac{3x}{2}$	$\frac{x^2}{2}$	$\frac{x^2 - 1}{2}$	Some other answer
K43	0 to 0.1	0.1 to 0.2	0.2 to 0.3	0.3 to 0.4	0.4 to 0.5	Some other answer
K44	C	D	E	F	G	Some other answer

Section L

L45. Given that  $\underline{a} = 2\underline{i} - 3\underline{j} + \underline{k}$  and  $\underline{b} = 3\underline{i} + 3\underline{j} - 2\underline{k}$ , which of the following is the vector  $\underline{a} + \underline{b}$

- C :  $5\underline{i} - \underline{k}$       D :  $5\underline{i} + \underline{j} - \underline{k}$   
 E :  $-\underline{i} - 6\underline{j} + 3\underline{k}$     F :  $2\underline{i} + 2\underline{j} - 3\underline{k}$   
 G :  $5\underline{i} - 3\underline{j} + 2\underline{k}$     H : None of the above

L46. For the vectors in L45, which is a unit vector parallel to  $\underline{a}$

- C :  $-\frac{2}{14}\underline{i} + \frac{3}{14}\underline{j} + \frac{1}{14}\underline{k}$       D :  $\frac{2}{14}\underline{i} - \frac{3}{14}\underline{j} + \frac{1}{14}\underline{k}$   
 E :  $-\frac{2}{\sqrt{14}}\underline{i} + \frac{3}{\sqrt{14}}\underline{j} - \frac{1}{\sqrt{14}}\underline{k}$     F :  $\frac{2}{\sqrt{14}}\underline{i} + \frac{3}{\sqrt{14}}\underline{j} - \frac{1}{\sqrt{14}}\underline{k}$   
 G :  $-\frac{2}{\sqrt{14}}\underline{i} + \frac{3}{\sqrt{14}}\underline{j} + \frac{1}{\sqrt{14}}\underline{k}$     H : None of the above

L47. For the vectors in L45, which of the following is the scalar product  $\underline{a} \cdot \underline{b}$

L48. Which of the following is the vector from  $(-3, 4, 2)$  to  $(1, 1, 6)$

- C :  $-4\underline{i} + 3\underline{j} - 4\underline{k}$     D :  $4\underline{i} - 3\underline{j} + 4\underline{k}$   
 E :  $-2\underline{i} + 5\underline{j} + 8\underline{k}$     F :  $2\underline{i} - 5\underline{j} - 8\underline{k}$   
 G :  $-\underline{i} + 2.5\underline{j} + 4\underline{k}$     H : None of the above

	C	D	E	F	G	H
L45	C	D	E	F	G	Some other answer
L46	C	D	E	F	G	Some other answer
L47	$3\underline{i} + 7\underline{j} + 15\underline{k}$	$6\underline{i} - 9\underline{j} - 2\underline{k}$	-5	25	36	Some other answer
L48	C	D	E	F	G	Some other answer

END OF TEST

Answers to the questions are as given below

A1	D	B5	D	C9	D	D13	E	E17	F	F21	D
A2	G	B6	H	C10	E	D14	G	E18	G	F22	G
A3	D	B7	F	C11	C	D15	E	E19	H	F23	F
A4	D	B8	F	C12	E	D16	E	E20	H	F24	F

G25	F	H29	C	I33	C	J37	C	K41	G	L45	C
G26	E	H30	E	I34	D	J38	D	K42	D	L46	D
G27	G	H31	D	I35	D	J39	C	K43	G	L47	E
G28	E	H32	G	I36	D	J40	C	K44	C	L48	D

## Reference to topics for similar questions

Each section (of this test and of the September test) consists of 4 questions on a given topic. In practice, there are more than 4 possible question types for each topic. The areas which may come up on the September test are listed below for each topic. Later there follows a set of references to further information on the areas of subject matter.

### Section A : Pre A-level algebra

1. Putting numbers in simple formula
2. Simple linear equation
3. Calculation of indices for a product
4. Calculation of indices for a quotient
5. Calculation of indices for a power
6. Re-arrange a formula
7. Two simultaneous equations
8. Rationalise a surd
9. Simple inequations

### Section B : Geometry and Trigonometry

1. Conversion between degrees and radians
2. Lengths of arcs
3. Areas of sectors
4. Simple right-angle trigonometry
5. Values of sec, csc and cot
6. Sine rule
7. Cosine rule
8. Simple trig identities
9. Finding  $\theta$  from a trig ratio and a range of  $\theta$ .
10. Coordinate systems
11. Equation of a straight line
12. Parallel and perpendicular lines
13. Conversions between polar and rectangular systems.
14. Geometry of circles

### Section C : Series

1. Finding a term from a general form
2. Finding common difference
3. Sum of arithmetic sequence
4. Other manipulations with arithmetic sequences/series
5. Finding common ratio (geometric series)
6. Sum of terms of geometric series
7. Sum to infinity
8. Other manipulations with geometric series

Section D : Functions

1. Evaluate a simple function
2. Composite Function
3. The modulus function
4. Inverse Function
5. Properties of  $f(x \pm a)$  on the basis of  $f(x)$
6. Properties of  $f(ax)$  on the basis of  $f(x)$
7. Odd and Even functions

Section E : Polynomials

1. Multiplying out brackets
2. Factorisation of quadratics
3. Complete the square
4. Solve quadratic equation
5. Factorise a cubic
6. Binomial Expansion
7. Remainder on division when one polynomial is divided by another

Section F : Logarithms and Exponentials

1. Log of a number to a given base.
2. Laws of logarithms
3. Solve  $a^x = b$  for given  $a$  and  $b$ .
4. Manipulations involving  $y = A + be^{cx}$ .
5. Graphs of  $\log x$  and  $e^x$ .

Section G : Differentiation

1. Differentiation of a polynomial
2. Location of maxima and minima
3. Differentiation of  $\log_e x$ ,  $e^x$ ,  $\sin x$ ,  $\cos x$ .
4. Chain rule for differentiation
5. Product Rule
6. Quotient Rule
7. Gradient of Tangent

Section H : Integration

1. Integrate a Polynomial
2. Integrate simple trig expressions
3. Integrate an exponential
4. Definite integrals
5. Manipulate and expression into polynomial and integrate
6. Area under a curve
7. Area between

Section I : Further Algebra

1. Algebraic Simplification of rational functions
2. Simple Partial Fractions
3. Form of Partial Fractions for repeated terms in denominator
4. The Binomial Series
5. For of Partial Fractions when numerator is of equal or greater degree than denominator.

Section J : Further Differentiation

1. Differentiation of more difficult trigonometric expressions
2. The Product Rule
3. The Quotient Rule
4. Parametric form of functions
5. Parametric differentiation
6. Implicit differentiation

Section K : Further Integration

1. Integration of  $\sin^2 px$  and  $\cos^2 px$
2. Integration of  $\tan^2 px, \sec^2 px, \csc^2 px, \cot^2 px$
3. Integration by substitution
4. volumes of revolution
5. Integration by parts

Section L : Vectors

1. Vectors in component form
2. Addition/subtraction of vectors
3. Multiplication of vector by scalar
4. Magnitude of Vector
5. Vectors from point to point
6. Unit Vectors parallel to given vectors
7. The Scalar Product
8. Vector equation of lines

The following tables show where similar questions and worked solutions can be found and also where some notes about the topics can be found. As well as references specific to individual questions, references relevant to sections of the test are given too. The texts are

Stroud : - "Engineering Mathematics" by KA Stroud. 5th edition, published by Palgrave. F2:1-11 means sections 1-11 of chapter F2; 13:5-10 means sections 5-10 of chapter 13.

Croft :- "Mathematics for Engineering - A modern interactive approach" by A Croft and R Davison. Published by Pearson. 5.3 means block 3 within chapter 5. 5.3.1 means block 3.1 within chapter 5.

Pledger : "Heinemann Modules Mathematics for Edexcel AS and A-level" by K Pledger et. al. Volumes C1, C2, C3 and C4. C1:8 means chapter 8 of volume C1

S-Cool : "<http://www.s-cool.co.uk/index.html>" web-based resource. Enter via the maths page "<http://www.s-cool.co.uk/alevel/maths.html>".

MathsNet : "<http://www.mathsnetalevel.com/>". web-based resource. Was formerly free but now relies on subscription.

Note that there are differences between the sections for 'Pledger' and 'MathsNet' despite the similar appearances.

Students should feel free to report other frequently-used resources against which cross-references can be made. Please send an e-mail to [colin.steele@manchester.ac.uk](mailto:colin.steele@manchester.ac.uk) mentioning a preferred web-based resource and this will be considered for addition to the resources above.

Question	Stroud	Croft	Pledger	S-cool	MathsNet
A1	F3:1-4	1.7.2			
A2	F5:1-6	3.1.3			C1:2
A3	F2:18-22	1.2.3	C1:1		C1:2
A4	F2:18-22	1.2.3	C1:1		C1:2
A5	F2:18-22	1.2.3	C1:1		C1:2
A6	F3:9-18	1.7.3			
A7	F5:7-11	3.4	C1:3		C1:3
A8			C1:1		C1:1
A9		3.5	C1:3		C1:3
Sect A	F1,F2,F3,F5	1 and 3		Basic Algebra	
B1	F8:4-8	5.1.2	C2:6		C2:4
B2			C2:6		C2:4
B3			C2:6		C2:4
B4	F8:13-16	5.2.1 to 5.2.4			
B5	F8:17-19	5.2.5	C3:6		C3:2
B6		6.2	C2:2		C2:4
B7		6.3	C2:2		C2:4
B8	F8:31-40	5.5	C2:10		C2:4
B9		5.3	C2:10		
B10	F4:5		C1:5		C1:3
B11	8:1-11	5.7.3 and 5.7.4	C1:5		C1:3
B12			C1:5		C1:3
B13	22:1-7				
B14			C2:4		C2:2
Sect B	F8	5 and 6		Coord. Geometry, Trig.	
C1		15.1.1	C1:6		C1:4
C2	13:5-10	15.1.4	C1:6		C1:4
C3	13:5-10	15.1.4	C1:6		C1:4
C4	13:5-10	15.1.4	C1:6		C1:4
C5	13:11-17	15.1.5	C2:7		C2:3
C6	13:11-17	15.1.5	C2:7		C2:3
C7	13:11-17	15.1.5	C2:7		C2:3
C8	13:11-17	15.1.5	C2:7		C2:3
Sect C	13	15.1		Sequences and Series	
D1	F12:1-7	2.1	C3:2		C3:1
D2	F12:20-24	2.3	C3:2		C3:1
D3		5.8.4	C3:5		C3:1
D4	F12:8-16	2.4	C3:2		C3:1
D5			C3:5		C3:1
D6			C3:5		C3:1
D7	F12:68-75				
Sect D	F12	2		Functions	
E1	F2:39-42	1.4	C1:1		C1:2
E2	F2:56-73	1.5	C1:1		C1:2
E3	F6:8-13	3.2.5	C1:3		C1:2
E4	F6:2-17	3.2	C1:3		C1:2
E5	F6:19-26	3.3			C1:2
E6	F9:20-31	15.3.3	C2:5		
E7	F2:48-52				C2:1
Sect E	F2,F6,F9	1 and 3		Basic Algebra	

Question	Stroud	Croft	Pledger	s-cool	MathsNet
F1	F2:24-25	4.2.2 to 4.2.3	C2:3		C2:5
F2	F2:26-28	4.2.4	C2:3		C2:5
F3	F2:61-66		C2:3		C2:5
F4		4.3 to 4.4	C3:3		C2:5
F5	F12:60-67	4.2.5 and 4.1.4	C3:3		C2:5
Sect F	F2:F12	4.2		Advanced Algebra	
G1	F10:10-20	11.2	C1:7		C1:5
G2	9:18-35	11.7	C2:9		C2:6
G3	F10:29-31	11.2.2	C3:8		C3:4
G4	7:5-10	12.2	C3:8		C3:4
G5	F10:32-33	12.1.2	C3:8		C3:4
G6	F10:34-36	12.1.3	C3:8		C3:4
G7	F10:1-7	12.6.2	C1:7		C1:5
Sect G	F10,7,8,9	11 and 12		Differentiation	
H1	F11:6-11	13.1.3	C1:8		C1:6
H2	F11:2-5	13.1.3	C4:6		C4:4
H3	F11:2-5	13.1.3	C4:6		C4:4
H4	F11:26-30	13.2.2	C2:11		C2:7
H5			C4:6		
H6	F11:26-30	13.3.2	C2:11		C2:7
H7	F11:37-40		C2:11		
Sect H	F11	13		Integration	
I1			C3:1		C3:1
I2	F7:1-21	3.6.3	C4:1		C4:1
I3	F7:25-42	3.6.4	C4:1		C4:1
I4	14:22-23	15.3.4	C4:3		C4:3
I5	F7:7-9	3.6.6	C4:1		C4:1
Sect I	F7	3.6		Advanced Algebra	
J1	7:1-18	12.1.2	C3:8		C3:4
J2	7:12-14	12.1.3	C3:8		C3:4
J3	7:15-18		C3:8		C3:4
J4	7:31-36	12.4	C4:2		C4:4
J5	7:31-36	12.3	C4:4		C4:4
J6	7:26-30		C4:4		C4:4
Sect J	7	12	P3:2	Differentiation	
K1	15:44-53	13.7.2	C4:6		
K2	15:44-53		C4:6		
K3	15:6-20	13.5	C4:6		C4:5
K4	19:2-7	14.2.2			
K5	15:21-30	13.4	C4:6		C4:5
Sect K	15	13 and 14		Integration	
L1	6:36-38	9.2.2 and 9.2.4	C4:5		C4:6
L2		9.1.3 and 9.2.4	C4:5		C4:6
L3		9.1.4	C4:5		C4:6
L4		9.2.4	C4:5		C4:6
L5		9.2.2	C4:5		C4:6
L6					
L7	6:41-46	9.3	C4:5		C4:6
L8		9.5.2	C4:5		C4:6
Sect L	6			Vectors, Lines and Planes	

## Electronic Questions

The University has also prepared a selection of electronic questions on the above topics. To access these questions, please go to the page [mathvle.eps.manchester.ac.uk](http://mathvle.eps.manchester.ac.uk) and then click on 'Pre-Diagnostic Practice for EEE, Chemistry, Mathematics and Optometry'. You will need to register so click on "create a new account" and follow the instructions there. Note that these instructions involve clicking on a link which will be sent to you in an e-mail message.

You will be prompted for an 'enrolment key'. The enrolment key is "entry2010" (5 lower-case letters followed by 4 numbers). Having done this, you will be able to choose a topic and look at some of the questions.

MACE students should instead click on the link to Diagnostic Training for First Year MACE Students, enrolment key MACE2009 i.e. 4 capital letters followed by 4 numbers.

When looking at a question, to enter your answer click on 'submit'. The first time you click on 'submit' will result in the computer letting you know how it has interpreted your answer. You can edit your answer again or you can click a second time and the computer will now process your answer.

You can also find some links to further instructions and a video about using the system.

Note that when you are looking at 'history of responses', one response generates several lines; ignore all lines except the last.

These electronic questions serve several purposes

1. A question can be tried a fairly large number of times with different coefficients etc.
2. The answer and feedback are instant
3. The feedback may well contain references to WHY a particular answer is wrong rather than just the correct answer.

Please feel free to have a look at the quizzes. You can try the questions as many times as you wish (There is a penalty  $\lambda$  of 0.5 for each wrong answer, or 1 for true or false questions) and you can come back for a fresh attempt as many times as desired. Please note that nobody is going to assign any marks on the basis of these questions ; they are purely for practice.

If you experience any difficulties with these electronic questions, or if you would like to ask something, please contact Dr Colin Steele ([colin.steele@manchester.ac.uk](mailto:colin.steele@manchester.ac.uk), Tel 0161 306 3632)