Paper Reference(s)

6663/01

Edexcel GCE

Core Mathematics C1

Gold Level G5

Time: 1 hour 30 minutes

Materials required for examination	**Items included with question papers**
Mathematical Formulae (Green)	Nil

Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulas stored in them.

Instructions to Candidates

Write the name of the examining body (Edexcel), your centre number, candidate number, the unit title (Core Mathematics C1), the paper reference (6663), your surname, initials and signature.

Information for Candidates

A booklet 'Mathematical Formulae and Statistical Tables' is provided.
Full marks may be obtained for answers to ALL questions.
There are 11 questions in this question paper. The total mark for this paper is 75.

Advice to Candidates

You must ensure that your answers to parts of questions are clearly labelled.
You must show sufficient working to make your methods clear to the Examiner.
Answers without working may gain no credit.

Suggested grade boundaries for this paper:

A*	A	B	C	D	E
63	55	48	40	32	24

1. Simplify

(a) $(2\sqrt{5})^2$,

(1)

(b) $\dfrac{\sqrt{2}}{2\sqrt{5}-3\sqrt{2}}$, giving your answer in the form $a + \sqrt{b}$, where a and b are integers.

(4)

May 2015

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2. Factorise completely $x - 4x^3$.

(3)

January 2013

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3. Express 8^{2x+3} in the form 2^y, stating y in terms of x.

(2)

January 2013

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4. A sequence a_1, a_2, a_3, ... is defined by

$$a_1 = 2,$$

$$a_{n+1} = 3a_n - c$$

where c is a constant.

(a) Find an expression for a_2 in terms of c.

(1)

Given that $\sum_{i=1}^{3} a_i = 0$,

(b) find the value of c.

(4)

January 2011

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5. The curve C has equation $y = x(5 - x)$ and the line L has equation $2y = 5x + 4$.

(*a*) Use algebra to show that C and L do not intersect.

(4)

(*b*) Sketch C and L on the same diagram, showing the coordinates of the points at which C and L meet the axes.

(4)

January 2012

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6. (*a*) By eliminating y from the equations

$$y = x - 4,$$

$$2x^2 - xy = 8,$$

show that

$$x^2 + 4x - 8 = 0.$$

(2)

(*b*) Hence, or otherwise, solve the simultaneous equations

$$y = x - 4,$$

$$2x^2 - xy = 8,$$

giving your answers in the form $a \pm b\sqrt{3}$, where a and b are integers.

(5)

May 2007

7.

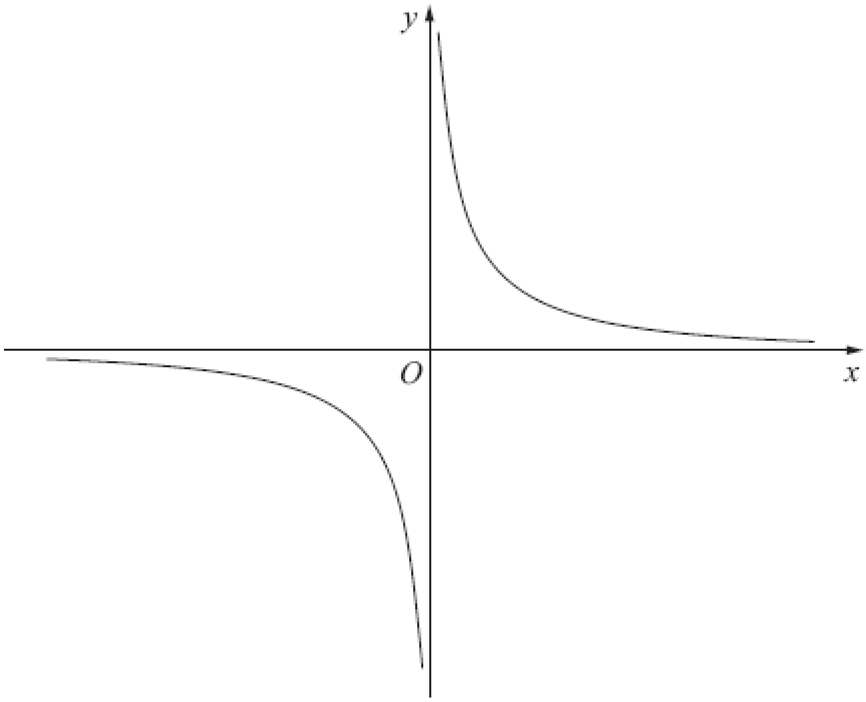

Figure 1

Figure 1 shows a sketch of the curve with equation $y = \frac{2}{x}$, $x \neq 0$.

The curve C has equation $y = \frac{2}{x} - 5$, $x \neq 0$, and the line l has equation $y = 4x + 2$.

(*a*) Sketch and clearly label the graphs of C and l on a single diagram.

On your diagram, show clearly the coordinates of the points where C and l cross the coordinate axes.

(5)

(*b*) Write down the equations of the asymptotes of the curve C.

(2)

(*c*) Find the coordinates of the points of intersection of $y = \frac{2}{x} - 5$ and $y = 4x + 2$.

(5)

January 2013

8. Given that $y = 2^x$,

(*a*) express 4^x in terms of y.

(1)

(*b*) Hence, or otherwise, solve

$$8(4^x) - 9(2^x) + 1 = 0.$$

(4)

May 2015

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9. The straight line with equation $y = 3x - 7$ does not cross or touch the curve with equation $y = 2px^2 - 6px + 4p$, where p is a constant.

(*a*) Show that $4p^2 - 20p + 9 < 0$.

(4)

(*b*) Hence find the set of possible values of p.

(4)

May 2016

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10. (*a*) Calculate the sum of all the even numbers from 2 to 100 inclusive,

$$2 + 4 + 6 + \dots\dots + 100.$$

(3)

(*b*) In the arithmetic series

$$k + 2k + 3k + \dots\dots + 100,$$

k is a positive integer and k is a factor of 100.

(i) Find, in terms of k, an expression for the number of terms in this series.

(ii) Show that the sum of this series is

$$50 + \frac{5000}{k}.$$

(4)

(*c*) Find, in terms of k, the 50th term of the arithmetic sequence

$$(2k + 1), \quad (4k + 4), \quad (6k + 7), \dots ,$$

giving your answer in its simplest form.

(2)

May 2011

11.

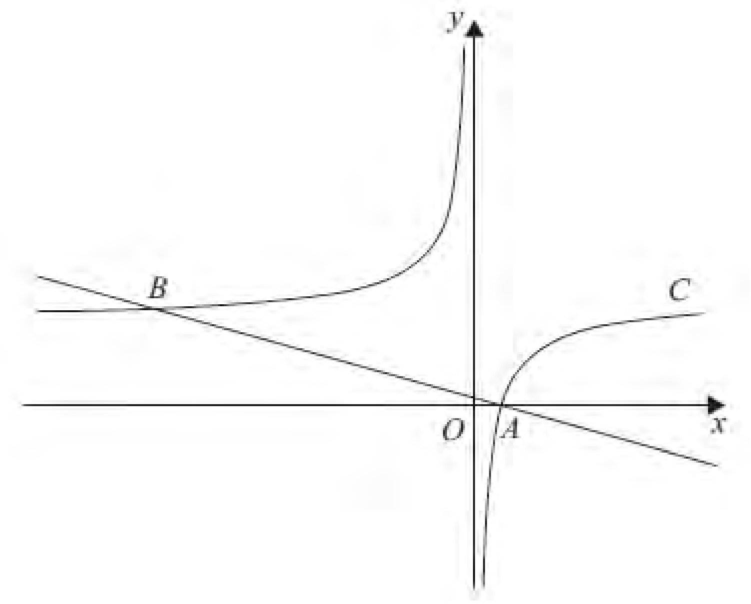


Figure 2

Figure 2 shows a sketch of the curve C with equation

$$y = 2 - \frac{1}{x}, \qquad x \neq 0.$$

The curve crosses the x-axis at the point A.

(a) Find the coordinates of A.

(1)

(b) Show that the equation of the normal to C at A can be written as

$$2x + 8y - 1 = 0.$$

(6)

The normal to C at A meets C again at the point B, as shown in Figure 2.

(c) Find the coordinates of B.

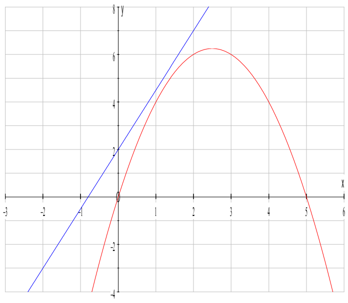
(4)

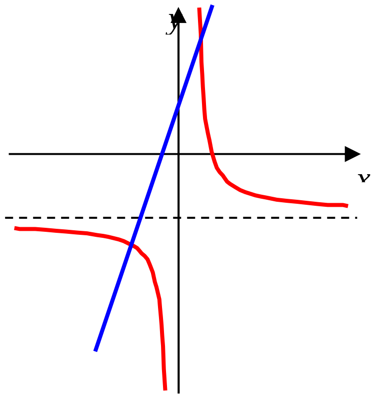
January 2012

TOTAL FOR PAPER: 75 MARKS

END

Question number	Scheme	Marks
1 (a)	20	B1 (1)
(b)	$\frac{\sqrt{2}}{2\sqrt{5}-3\sqrt{2}} \times \frac{2\sqrt{5}+3\sqrt{2}}{2\sqrt{5}+3\sqrt{2}}$	M1
	$= \frac{\dots}{2}$	A1
	Numerator = $\sqrt{2}(2\sqrt{5} \pm 3\sqrt{2}) = 2\sqrt{10} \pm 6$	M1
	$\frac{\sqrt{2}}{2\sqrt{5}-3\sqrt{2}} = \frac{2\sqrt{10}+6}{2} = 3+\sqrt{10}$	A1
		(4) [5]
2	$x(1-4x^2)$	B1
	Accept $x(-4x^2+1)$ or $-x(4x^2-1)$ or $-x(-1+4x^2)$ or even $4x(\frac{1}{4}-x^2)$ or equivalent	
	quadratic (or initial cubic) into two brackets	M1
	$x(1-2x)(1+2x)$ or $-x(2x-1)(2x+1)$ or $x(2x-1)(-2x-1)$	A1
		[3]
3	$(8^{2x+3} = (2^3)^{2x+3}) = 2^{3(2x+3)}$ or 2^{ax+b} with $a = 6$ **or** $b = 9$	M1
	$= 2^{6x+9}$ *or* $= 2^{3(2x+3)}$ as **final** answer with no errors or $(y =) 6x+9$ or $3(2x+3)$	A1
		[2]
4 (a)	$(a_2 =)\ 6-c$	B1 (1)
(b)	$a_3 = 3(\text{their } a_2) - c \qquad (= 18 - 4c)$	M1
	$a_1 + a_2 + a_3 = 2 + "(6-c)" + "(18-4c)"$	M1
	"$26-5c$" $= 0$	A1ft
	So $c = 5.2$	A1 oae
		(4) [5]

Question number	Scheme	Marks
5 (a)	$x(5-x)=\frac{1}{2}(5x+4)$ (o.e.)	M1
	$2x^2-5x+4(=0)$ (o.e.) e.g. $x^2-2.5x+2(=0)$	A1
	$b^2-4ac=(-5)^2-4\times2\times4$	M1
	$=25-32$ <0, so no roots <u>or</u> no intersections <u>or</u> no solutions	A1
		(4)
(b)	 Curve: $\cap$ shape and passing through (0, 0)	B1
	$\cap$ shape and passing through (5, 0)	B1
	Line : +ve gradient and no intersections with *C*. If no *C* drawn score B0	B1
	Line passing through (0, 2) and (−0.8, 0) marked on axes	B1
		(4)
		[8]
6 (a)	$2x^2-x(x-4)=8$	M1
	$x^2+4x-8=0$	A1cso
		(2)
(b)	$x=\frac{-4\pm\sqrt{4^2-(4\times1\times-8)}}{2}$ or $(x+2)^2\pm4-8=0$	M1
	$x=-2\pm$ (any correct expression)	A1
	$\sqrt{48}=\sqrt{16}\sqrt{3}=4\sqrt{3}$ or $\sqrt{12}=\sqrt{4}\sqrt{3}=2\sqrt{3}$	B1
	$y=(-2\pm2\sqrt{3})-4$ M: Attempt at least one y value	M1
	$x=-2+2\sqrt{3},\ y=-6+2\sqrt{3}$ $x=-2-2\sqrt{3},\ y=-6-2\sqrt{3}$	A1
		(5)
		[7]

Question number	Scheme	Marks
7 (a)	 $y = \frac{2}{x}$ is translated up or down. $y = \frac{2}{x} - 5$ is in the correct position. Intersection with x-axis at $\left(\frac{2}{5}, \{0\}\right)$ **only** Independent mark. $y = 4x + 2$: attempt at straight line, with positive gradient with positive y intercept. Intersection with x-axis at $\left(-\frac{1}{2}, \{0\}\right)$ **and** y-axis at $\left(\{0\}, 2\right)$. Check graph in question for possible answers and space below graph for answers to part (b)	M1 A1 B1 B1 B1 **(5)**
(b)	Asymptotes : $x = 0$ (or y-axis) and $y = -5$. (Lose second B mark for extra asymptotes) — An asymptote stated correctly. Independent of (a) $y = -5$. (Lose second B mark for extra asymptotes) — These two lines only. Not ft their graph	B1 B1 **(2)**
(c)	Method 1: $\frac{2}{x} - 5 = 4x + 2$ — Method 2: $\frac{y-2}{4} = \frac{2}{y+5}$ $4x^2 + 7x - 2 = 0 \Rightarrow x =$ — $y^2 + 3y - 18 = 0 \rightarrow y =$ $x = -2, \frac{1}{4}$ — $y = -6, 3$ When $x = -2$, $y = -6$, When $x = \frac{1}{4}$, $y = 3$ — When $y = -6$, $x = -2$. When $y = 3$, $x = \frac{1}{4}$.	M1 dM1 A1 M1A1 **(5)** **[12]**
8 (a)	$\left(4^x =\right) y^2$ Allow y^2 or $y \times y$ or "y squared" "$4^x =$" not required	B1 **(1)**
(b)	$8y^2 - 9y + 1 = (8y-1)(y-1) = 0 \Rightarrow y = ...$ or $(8(2^x) - 1)((2^x) - 1) = 0 \Rightarrow 2^x = ...$ $2^x (\text{or } y) = \frac{1}{8},\ 1$ $x = -3 \quad x = 0$	M1 A1 M1 A1 **(4)** **[5]**

Question number	Scheme	Marks
9 (a)	$2px^2 - 6px + 4p " = " 3x - 7$ or $y = 2p\left(\frac{y+7}{3}\right)^2 - 6p\left(\frac{y+7}{3}\right) + 4p$	M1
	<u>Examples</u> $2px^2 - 6px + 4p - 3x + 7(=0)$, $-2px^2 + 6px - 4p + 3x - 7(=0)$ $2p\left(\frac{y+7}{3}\right)^2 - 6p\left(\frac{y+7}{3}\right) + 4p - y(=0)$, $2py^2 + (10p-9)y + 8p(=0)$ $y = 2px^2 - 6px + 4p - 3x + 7$	dM1
	E.g. $b^2 - 4ac = (-6p-3)^2 - 4(2p)(4p+7)$ $b^2 - 4ac = (10p-9)^2 - 4(2p)(8p)$	ddM1
	$4p^2 - 20p + 9 < 0$ *	A1*
		(4)
(b)	$(2p-9)(2p-1)=0 \Rightarrow p = ...$ to obtain $p =$	M1
	$p = \frac{9}{2}, \quad \frac{1}{2}$	A1
	$\frac{1}{2} < p < 4\frac{1}{2}$	M1 A1
		(4)
		[8]

Question number	Scheme	Marks
10 (a)	Series has 50 terms	B1
	$S = \frac{1}{2}(50)(2+100) = 2550$ or $S = \frac{1}{2}(50)(4+49\times 2) = 2550$	M1 A1
		(3)
(b)(i)	$\frac{100}{k}$	B1
(ii)	Sum: $\frac{1}{2}\left(\frac{100}{k}\right)(k+100)$ or $\frac{1}{2}\left(\frac{100}{k}\right)\left(2k+\left(\frac{100}{k}-1\right)k\right)$	M1 A1
	$= 50 + \frac{5000}{k}$ (*)	A1 cso
		(4)
(c)	50^{th} term = $a+(n-1)d$	
	$=(2k+1)+49\text{"}(2k+3)\text{"}$ | Or $2k+49(2k)+1+49(3)$	M1
	$=100k+148$ | $=100k+148$	A1
		(2)
		[9]

Question number	Scheme	Marks
11 (a)	$\left(\frac{1}{2}, 0\right)$	B1
		(1)
(b)	$\frac{dy}{dx} = x^{-2}$	M1A1
	At $x = \frac{1}{2}$, $\frac{dy}{dx} = \left(\frac{1}{2}\right)^{-2} = 4$ $(= m)$	A1
	Gradient of normal $= -\frac{1}{m}$ $\left(= -\frac{1}{4}\right)$	M1
	Equation of normal: $y - 0 = -\frac{1}{4}\left(x - \frac{1}{2}\right)$	M1
	$2x + 8y - 1 = 0$ **(*)**	A1cso
		(6)
(c)	$2 - \frac{1}{x} = -\frac{1}{4}x + \frac{1}{8}$	M1
	$[= 2x^2 + 15x - 8 = 0]$ <u>or</u> $[8y^2 - 17y = 0]$	
	$(2x - 1)(x + 8) = 0$ leading to $x = \ldots$	M1
	$x = \left[\frac{1}{2}\right]$ or -8	A1
	$y = \frac{17}{8}$ (or exact equivalent)	A1ft
		(4) **[11]**

Examiner reports

Question 1

(a) This mark was scored by the majority of candidates. The most common error was to misinterpret the demand as $(2 + \sqrt{5})^2$ rather than $(2\sqrt{5})^2$.

(b) Most candidates rationalised the denominator by the correct expression with a few using a multiple of $2\sqrt{5} + 3\sqrt{2}$ such as $-2\sqrt{5} - 3\sqrt{2}$ or $10(2\sqrt{5} + 3\sqrt{2})$. Some candidates then evaluated the denominator incorrectly and a significant number of candidates who correctly obtained $(2\sqrt{10} + 6)/2$, simplified incorrectly to $\sqrt{10} + 6$, or $2\sqrt{10} + 3$. A small number of candidates used a slightly more efficient route of multiplying the top and bottom of the fraction by $\sqrt{2}$, making the rationalisation a little easier.

Question 2

This question was correctly answered by most of the candidates. The vast majority of candidates got the first mark for identifying the factor of x or $-x$ (or occasionally $4x$), though a significant number of candidates stopped at this point without taking into account that the question was worth 3 marks. A minority did not gain this first mark as they wrote erroneous statements such as $x - 4x^3 = x(4x^2 - 1)$.

Of the candidates who progressed beyond the initial step, most correctly factorised the resulting quadratic using a difference of 2 squares correctly in their final factorisation. Some candidates made errors particularly sign errors. A number of candidates "lost" the 1 and gave $x(-4x^2)$ which demonstrated weak algebraic understanding and some went on to try and solve for x by setting the equation equal to 0. Some candidates did not distinguish between factorising and solving.

A small number of candidates gained the first mark, by a correct initial factorisation and then reversed the negatives in factorising the quadratic to give $x(2x + 1)(2x - 1)$, thus losing the accuracy marks and gaining just 2 of the 3 marks available.

Question 3

The majority of the candidates answered this question efficiently and correctly and gained the two marks. Many others did state that $8 = 2^3$ somewhere in their workings, but lacked any evidence of multiplication of the powers 3 and $2x + 3$ to gain the method mark. There were a number of candidates who incorrectly ended up using $8 = 2^{\frac{1}{3}}$. Common errors included dividing by 4, attempting to cube $(2x + 3)$ or expanding $3(2x + 3)$ wrongly to get $6x + 6$ or $6x + 3$. The most common error was to add the powers (instead of multiplying them), giving $2^{2x+}6$. A small minority attempted to use logarithms, but this was rare.

Question 4

On the whole, this was a high scoring question, with most candidates understanding the notation and 45% obtaining full marks. Almost all candidates earned the first mark for $6 - c$ or $3 \times 2 - c$, given as their answer in part (a). A correct expression for the third term was seen regularly, occasionally followed by incorrect simplification to $18 - 2c$ or even $18 - c$. Candidates who attempted to use the formula for the sum of an Arithmetic Progression lost the final three marks. A few candidates simply equated the expression for the third term to zero and solved to find c, ignoring or not understanding the summation.

Question 5

Most could start part (a) by attempting to form a suitable equation but slips in simplifying the equation of the line ($y = \frac{5}{2}x + 4$ was common) often meant that the correct equation was not obtained. Those who did have a correct quadratic usually used the discriminant (sometimes as part of the quadratic formula) to complete the question. A sizeable number though simply tried to factorise and concluded that since the equation did not factorise therefore there were no roots or *C* and *L* do not intersect.

The candidates usually fared better in part (b) and there were many excellent sketches scoring full marks. Weaker candidates had the parabola the wrong way up and it was not uncommon to see the line crossing the curve despite the information given in part (a). Very few lost marks for their line or curve stopping on the axes although some thought that if they drew their line stopping before it crossed the curve that would satisfy the information in part (a). Some candidates lost a mark for failing to indicate the coordinates (–0.8, 0) where the line crossed the *x*-axis.

Question 6

In part (a) most tried the simple substitution of (x – 4) into the second equation. Some made a sign error (–4x instead of +4x) and proceeded to use this incorrect equation in part (b). Some candidates did not realise that part (a) was a first step towards solving the equations and repeated this work at the start of part (b) (sometimes repairing mistakes made there). The major loss of marks in part (b) was a failure to find the *y* values but there were plenty of errors made in trying to find *x* too. Those who attempted to complete the square were usually successful although some made sign errors when rearranging the 2 and some forgot the ± sign. Of those who used the quadratic formula it was surprising how many incorrect versions were seen. Even using the correct formula was no guarantee of success as incorrect cancelling was common: $\frac{-4 \pm \sqrt{48}}{2}$ was often simplified to $-2 \pm \sqrt{24}$ or $\frac{-4 \pm 4\sqrt{3}}{2}$ became $-2 \pm 4\sqrt{3}$.

Question 7

In Q7(a) the topic testing transformation of a graph proved to challenging to the candidates as the graph was given in the specific form rather than the more general form of y = f(x) – 5. The majority of answers had a correct shaped graph but many varieties of translation, left or right were quite common. Those that did perform a translation of 5 units down often omitted to find the *x*-intercept thus losing a mark. Poor drawing with graphs overlapping or incorrect curvature also lost marks.

The straight line graph was drawn well and was usually in the correct position, but many candidates forgot to find the intercepts, particularly the *x*-intercept which required some algebraic manipulation.

In Q7(b) candidates were asked to give the equations of the asymptotes. A common error seen was to confuse the *x* and *y* to give the asymptotes as $x = -5$ and y = 0 instead of $x = 0$ and $y = -5$. A large number of candidates left this section blank and a few stated $x \neq 0$ and $y \neq -5$ which lost one of the two marks. The asymptote $y = -5$ was more often given than $x = 0$ even though the question asked for the equations of the asymptotes. Those who translated the graph up, left or right could still obtain the correct asymptotes, as these answers could be obtained independently and correctly from the equation.

In Q7(c), many candidates realised that they had to eliminate one variable in order to find the point of intersection. Most chose to equate the y terms and then demonstrated their competence in solving the resulting three term quadratic. However many answers contained algebraic errors and hence incorrect co-ordinates. Candidates would be advised to look for errors in their working, when they reach an unlikely answer.

Some candidates found manipulating the fractions challenging, but continued after finding one variable.

Question 8

In part (a) many candidates gave $4^x = 2y$ and then proceeded to use this in (b), thus gaining no marks for this question. Others probably realised that this was incorrect but were unable to find an alternative and so left the question blank. In a number of instances there was valid working but no explicit y^2, so no mark in (a) but often the y^2 was then used correctly in (b).

In part (b) candidates who had been successful in (a) almost invariably made a good start to (b). A few did not appear to make the connection between the parts and started afresh in (b), with varying degrees of success. Those that were able to produce a quadratic usually gave the correct one and solved it correctly for y. However, several left their answers in terms of y and then neglected to find the values for x, thus losing the final two marks. Of those who did go on to find values for x, errors included $x = 1$ from $y = 1$ and $x = \frac{1}{3}$ rather than $x = -3$. Logs were seen infrequently.

Question 9

This proved to be one of the more challenging questions on the paper although most candidates were able to score at least half of the available marks.

Most candidates recognised that the first part needed the use of the discriminant of a quadratic. Unfortunately this was often applied to the given quadratic, with no attempt to involve the line. When the two equations were connected and terms brought to one side, sign errors were relatively common. A few solutions had a discriminant involving x and a common error was to use $b = 6p - 3$. There were, however, a fair number of efficient and accurate solutions.

The best solutions for the second part of the question used factorisation, and a sketch was often drawn to decide on the correct region. Those who used the formula made work for themselves and often lost accuracy, while only a handful managed to complete the square and obtain the right answer. Some candidates just gave the critical values without trying to find a region. Of those who attempted an inequality, many wrote it in a correct form but a few used x instead of p and some omitted to write 'and' when expressing the final answer as two separate inequalities.

Question 10

This question was found difficult by many. Part marks 3, 0, 2 were common, although some did try to use the sum formula correctly in part (b) to obtain the method mark. Relatively few could establish the number of terms for this part, and proceed to use it correctly.

The majority of candidates knew which formula to use in part (a) and consequently gained the method mark. The problem was realising there were 50 even numbers, common errors were n = 100, 99, 98 or even 49. Calculating 25×102 correctly, caused problems for many. Only a small number of weaker candidates did not use the formula but wrote out all the terms and attempted to add. They were rarely successful.

Many candidates seemed unclear how to attempt part (b)(i). Often it was not attempted; nk was a common wrong answer. There were a few candidates who got $n = \frac{100}{k}$, but then failed to use this in part (b)(ii).

In part (b)(ii) many candidates scored only the method mark. Those who chose the '1st plus last' formula found the easier proof, the other sum formula leading to problems with the brackets for some students. Some became confused by $\frac{1}{2}n = \frac{100}{k/2}$ arriving at $\frac{200}{k}$ or $200k$ or $50k$. Others attempted to work backwards from the result with little success.

The majority of candidates were successful with part (c) even if they had failed to score many marks in the previous sections. Many could find $d = 2k + 3$ and use a correct formula for the 50th term, but several continued after reaching $100k + 148$ to rewrite it as $50k + 74$ or $25k + 37$. Common errors were using a sum formula or making a sign slip when finding d. This type of question needs to be read carefully

Question 11

This was a substantial question to end the paper and a number of candidates made little attempt beyond part (a). Part (c) proved quite challenging but there were some clear and succinct solutions seen.

Some stumbled at the first stage obtaining $x = 2$ or even 1 instead of $\frac{1}{2}$ to the solution of $2 - \frac{1}{x} = 0$ but most scored the mark for part (a).

The key to part (b) was to differentiate to find the gradient of the curve and most attempts did try this but a number had $-x^{-2}$. Some however tried to establish the result without differentiation and this invariably involved inappropriate use of the printed answer. Those who did differentiate correctly sometimes struggled to evaluate $\left(\frac{1}{2}\right)^{-2}$ correctly. A correct "show that" then required clear use of the perpendicular gradient rule and the use of their answer to part (a) to form the equation of the normal. There were a good number of fully correct solutions to this part but plenty of cases where multiple slips were made to arrive at the correct equation.

Most candidates set up a correct equation at the start of part (c) but simplifying this to a correct quadratic equation proved too challenging for many. Those who did arrive at $2x^2 + 15x - 8 = 0$ or $8y^2 - 17y = 0$ were usually able to proceed to find the correct coordinates of B, but there were sometimes slips here in evaluating $2 - \frac{1}{-8}$ for example.

There were a few candidates who used novel alternative approaches to part (c) such as substituting xy for $2x - 1$ from the equation of the curve into the equation of the normal to obtain the simple equation $8y + xy = 0$ from whence the two intersections $y = 0$ and $x = -8$ were obtained.

Statistics for C1 Practice Paper Gold Level G5

				Mean score for students achieving grade:							
Qu	**Max score**	**Modal score**	**Mean %**	**ALL**	**A***	**A**	**B**	**C**	**D**	**E**	**U**
1	5	5	82	4.09	4.94	4.79	4.53	4.26	3.98	3.61	2.62
2	3	3	63	1.90	2.96	2.73	2.38	2.16	1.92	1.65	1.35
3	2	0	51	1.01	1.98	1.72	1.41	1.14	0.94	0.86	0.66
4	5		63	3.13	4.88	4.61	4.09	3.49	2.96	2.43	1.65
5	8		54	4.34	7.81	7.18	6.12	5.13	4.18	3.37	1.96
6	7		63	4.41		5.76	5.10	4.70	4.23	3.59	2.32
7	12	12	61	7.32	11.56	11.11	9.90	8.56	7.24	5.71	3.21
8	5	0	50	2.50	4.61	4.07	3.00	2.40	1.90	1.40	0.68
9	8	8	55	4.42	7.41	6.64	5.25	4.25	3.41	2.66	1.52
10	9		55	4.91	8.36	7.44	5.70	4.84	4.15	3.56	2.37
11	11		47	5.12	10.95	10.36	8.63	6.58	4.23	3.19	1.09
	75		**57.53**	**43.15**	**65.46**	**66.41**	**56.11**	**47.51**	**39.14**	**32.03**	**19.43**