Edexcel Maths C1

Topic Questions from Papers

Quadratics

3.

$$x^2 - 8x - 29 \equiv (x+a)^2 + b,$$

where a and b are constants.

(a) Find the value of a and the value of b.

(3)

(b) Hence, or otherwise, show that the roots of

$$x^2 - 8x - 29 = 0$$

are $c \pm d\sqrt{5}$, where c and d are integers to be found.

(3)

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3. On separate diagrams, sketch the graphs of

(a)
$$y = (x+3)^2$$
,

(3)

(b)
$$y = (x + 3)^2 + k$$
, where k is a positive constant.

(2)

Show on each sketch the coordinates of each point at which the graph meets the axes.

(a) Find the value of p.	(4)
	(4)
(b) For this value of p, solve the equation $x^2 + 2px + (3p + 4) = 0$.	
	(2)

Leave
blank

	The equation $2x^2 - 3x - (k+1) = 0$, where k is a constant, has no real roots.	
Find the set of possible values of k .		
		(4)
_		

Leave
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7.	The equation	$x^2 + kx + (k+3) = 0,$	where k is a constant,	has different real roots.
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(a) Show that $k^2 - 4k - 12 > 0$.

(2)

(b) Find the set of possible values of k.

(4)





8.	The	eq	uation
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$$x^2 + kx + 8 = k$$

has no real solutions for x.

(a) Show that k satisfies $k^2 + 4k - 32 \le 0$.

(3)

(b) Hence find the set of possible values of k.

(4)

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blank	

3. Given that the equation $2qx^2 + qx - 1 = 0$, where q is a constant, he	as no real roots,
(a) show that $q^2 + 8q < 0$.	(2)
(b) Hence find the set of possible values of q .	(3)

7.	The equation $kx^2 + 4x + (5 - k) = 0$, where k is a constant, has 2 different real solutions
	for x.

(a) Show that k satisfies

$$k^2 - 5k + 4 > 0$$
.

(3)

(h)	Hence	find	the	cet	οf	possible	values	of I	ŀ
(U)	Hence	IIIIu	uie	SCL	ΟI	possible	varues	OI I	ι.

(b) Hence find the set of possible values of k .	(4

Find the value of p .	
	(4)

10.	$f(x) = x^2 + 4kx + (3+11k),$	where k is a constant.
	_(,	

(a) Express f(x) in the form $(x+p)^2 + q$, where p and q are constants to be found in terms of k.

(3)

Given that the equation f(x) = 0 has no real roots,

(b) find the set of possible values of k.

(4)

Given that k = 1,

(c) sketch the graph of y = f(x), showing the coordinates of any point at which the graph crosses a coordinate axis.

(3)

Question 10 continued	blank
	Q10
(Total 10 marks)	
TOTAL FOR PAPER: 75 MARKS	
END	



(a) Show that $x^2 + 6x + 11$ can be written as

$$(x+p)^2+q$$

where p and q are integers to be found.

(2)

(b) In the space at the top of page 7, sketch the curve with equation $y = x^2 + 6x + 11$, showing clearly any intersections with the coordinate axes.

(2)

(c)	Find the	value of	the discri	minant o	$f x^2$	+6x+11
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2)

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			` '

Question 4 continued	Leave blank
	Q4
(Total 6 marks)	



- 8. The equation $x^2 + (k-3)x + (3-2k) = 0$, where k is a constant, has two distinct real roots.
 - (a) Show that k satisfies

$$k^2 + 2k - 3 > 0$$

(3)

((b)	Find	the	set	of	possible	values	of k
		, 11114	uii	SCL	$\mathbf{O}_{\mathbf{I}}$	possible	varues	OIN

(4)

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7.	$f(x) = x^2 + (k+3)x + k$
<i>i</i> •	I(x) = x + (x + 3)x + x

where k is a real constant.

(a) Find the discriminant of f(x) in terms of k.

(2)

(b) Show that the discriminant of f(x) can be expressed in the form $(k+a)^2 + b$, where a and b are integers to be found.

(2)

(c) Show that, for all values of k, the equation f(x) = 0 has real roots.

(2)

9. T	ne equation	1

 $(k+3)x^2 + 6x + k = 5$, where k is a constant,

has two distinct real solutions for x.

(a) Show that k satisfies

$$k^2 - 2k - 24 < 0$$

(4)

(b) Hence find the set of possible values of k.

(3)

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Core Mathematics C1

Mensuration

Surface area of sphere = $4\pi r^2$

Area of curved surface of cone = $\pi r \times \text{slant height}$

Arithmetic series

$$u_n = a + (n-1)d$$

$$S_n = \frac{1}{2}n(a+l) = \frac{1}{2}n[2a+(n-1)d]$$