

Edexcel Maths C1

Topic Questions from Papers

Quadratics



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.





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5. 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)

Handwritten solution area consisting of multiple horizontal lines.

Q5

Mark entry box:

(Total 4 marks)







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8. Given that the equation  $2qx^2 + qx - 1 = 0$ , where  $q$  is a constant, has no real roots,

(a) show that  $q^2 + 8q < 0$ . (2)

(b) Hence find the set of possible values of  $q$ . (3)

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- 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)

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**Question 10 continued**

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**Q10**

(Total 10 marks)

**TOTAL FOR PAPER: 75 MARKS**

**END**



4. (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 discriminant of  $x^2 + 6x + 11$

(2)

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7.  $f(x) = x^2 + (k + 3)x + k$

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)

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## Core Mathematics C1

### *Mensuration*

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

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

### *Arithmetic series*

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

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