

C1 CURVE SKETCHING PPO'S

1

MAY 08

6. The curve C has equation $y = \frac{3}{x}$ and the line l has equation $y = 2x + 5$.

(a) On the axes below, sketch the graphs of C and l , indicating clearly the coordinates of any intersections with the axes. (3)

(b) Find the coordinates of the points of intersection of C and l . (6)

2

JANUARY 09

8. The point $P(1, a)$ lies on the curve with equation $y = (x + 1)^2(2 - x)$.

(a) Find the value of a . (1)

(b) On the axes below sketch the curves with the following equations:

(i) $y = (x + 1)^2(2 - x)$,

(ii) $y = \frac{2}{x}$.

On your diagram show clearly the coordinates of any points at which the curves meet the axes. (5)

(c) With reference to your diagram in part (b) state the number of real solutions to the equation

$$(x + 1)^2(2 - x) = \frac{2}{x}.$$

(1)

3

MAY 07

9. The curve C with equation $y = f(x)$ passes through the point $(5, 65)$.

Given that $f'(x) = 6x^2 - 10x - 12$,

(a) use integration to find $f(x)$. (4)

(b) Hence show that $f(x) = x(2x + 3)(x - 4)$. (2)

(c) In the space provided on page 17, sketch C , showing the coordinates of the points where C crosses the x -axis. (3)

4

10. The curve C has equation

$$y = (x+3)(x-1)^2.$$

- (a) Sketch C showing clearly the coordinates of the points where the curve meets the coordinate axes. (4)

JANUARY 08

- (b) Show that the equation of C can be written in the form

$$y = x^3 + x^2 - 5x + k,$$

where k is a positive integer, and state the value of k . (2)

There are two points on C where the gradient of the tangent to C is equal to 3.

- (c) Find the x -coordinates of these two points. (6)

5

10. (a) On the same axes sketch the graphs of the curves with equations

(i) $y = x^2(x-2),$

(3)

JANUARY 07

(ii) $y = x(6-x),$

(3)

and indicate on your sketches the coordinates of all the points where the curves cross the x -axis.

- (b) Use algebra to find the coordinates of the points where the graphs intersect. (7)

6. 10.

$$x^2 + 2x + 3 \equiv (x+a)^2 + b.$$

- (a) Find the values of the constants a and b . (2)

- (b) Sketch the graph of $y = x^2 + 2x + 3$, indicating clearly the coordinates of any intersections with the coordinate axes. (3)

- (c) Find the value of the discriminant of $x^2 + 2x + 3$. Explain how the sign of the discriminant relates to your sketch in part (b). (2)

The equation $x^2 + kx + 3 = 0$, where k is a constant, has no real roots.

- (d) Find the set of possible values of k , giving your answer in surd form. (4)

JANUARY 06