JAN 2006

Leave blank

8. The curve with equation $y = f(x)$ passes through the point (1, 6). Given that

$$f'(x) = 3 + \frac{5x^2 + 2}{x^{\frac{1}{2}}}, \quad x > 0,$$

find $f(x)$ and simplify your answer.

(7)

JAW 2009

Leave blank

4. A curve has equation $y = f(x)$ and passes through the point (4, 22).

Given that

$$f'(x) = 3x^2 - 3x^{\frac{1}{2}} - 7,$$

use integration to find $f(x)$, giving each term in its simplest form.

(5)

C1 JAN 2011

Leave blank

2. Find

$$\int (12x^5 - 3x^2 + 4x^{\frac{1}{3}})\, dx$$

giving each term in its simplest form.

(5)

Q2

(Total 5 marks)

C1 Jan 2012

Leave blank

7. A curve with equation $y = f(x)$ passes through the point (2, 10). Given that

$$f'(x) = 3x^2 - 3x + 5$$

find the value of $f(1)$.

(5)

JUNE 2008

Leave blank

11. The gradient of a curve C is given by $\frac{dy}{dx} = \frac{(x^2+3)^2}{x^2}$, $x \neq 0$.

(a) Show that $\frac{dy}{dx} = x^2 + 6 + 9x^{-2}$.

(2)

The point (3, 20) lies on C.

(b) Find an equation for the curve C in the form $y = f(x)$.

(6)

MAY 2007

Leave blank

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)

C1 May 2011

Leave blank

6. Given that $\dfrac{6x+3x^{\frac{5}{2}}}{\sqrt{x}}$ can be written in the form $6x^p+3x^q$,

(a) write down the value of p and the value of q.

(2)

Given that $\dfrac{dy}{dx}=\dfrac{6x+3x^{\frac{5}{2}}}{\sqrt{x}}$, and that $y = 90$ when $x = 4$,

(b) find y in terms of x, simplifying the coefficient of each term.

(5)

C1 May 2012

Leave blank

7. The point $P\,(4, -1)$ lies on the curve C with equation $y = f(x)$, $x > 0$, and

$$f'(x) = \frac{1}{2}x - \frac{6}{\sqrt{x}} + 3$$

(a) Find the equation of the tangent to C at the point P, giving your answer in the form $y = mx + c$, where m and c are integers.

(4)

(b) Find $f(x)$.

(4)

C1 Jan 2013

Leave blank

8. $$\frac{dy}{dx} = -x^3 + \frac{4x - 5}{2x^3}, \quad x \neq 0$$

Given that $y = 7$ at $x = 1$, find y in terms of x, giving each term in its simplest form.

(6)

C1 MAY 2013

Leave blank

9.

$$f'(x) = \frac{(3 - x^2)^2}{x^2}, \quad x \neq 0$$

(a) Show that $f'(x) = 9x^{-2} + A + Bx^2$,

where A and B are constants to be found.

(3)

(b) Find $f''(x)$.

(2)

Given that the point $(-3, 10)$ lies on the curve with equation $y = f(x)$,

(c) find $f(x)$.

(5)