

10 The equation of the line L_1 is $y - 2x - 6 = 0$

The point P with coordinates $(2, a)$ lies on L_1

(a) Find the value of a

(1)

The line L_2 is perpendicular to L_1 and passes through P

(b) Show that an equation of L_2 is $x + 2y - 22 = 0$

(4)

Line L_1 crosses the x -axis at the point A and line L_2 crosses the x -axis at the point B

The point C has coordinates (m, n) such that $m > 0$ and $n < 0$

The length of AC is $5\sqrt{2}$ and the gradient of BC is $\frac{1}{4}$

(c) Find the value of m and the value of n

(9)

(d) Find the area of quadrilateral $ACBP$

(3)

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Question 10 continued

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Question 10 continued

Handwriting practice area with horizontal dotted lines.

(Total for Question 10 is 17 marks)



11 Given that

$$y = \frac{e^{4x}}{32} (8x^2 - 4x + 1)$$

(a) show that $\frac{dy}{dx} = x^2 e^{4x}$

(5)

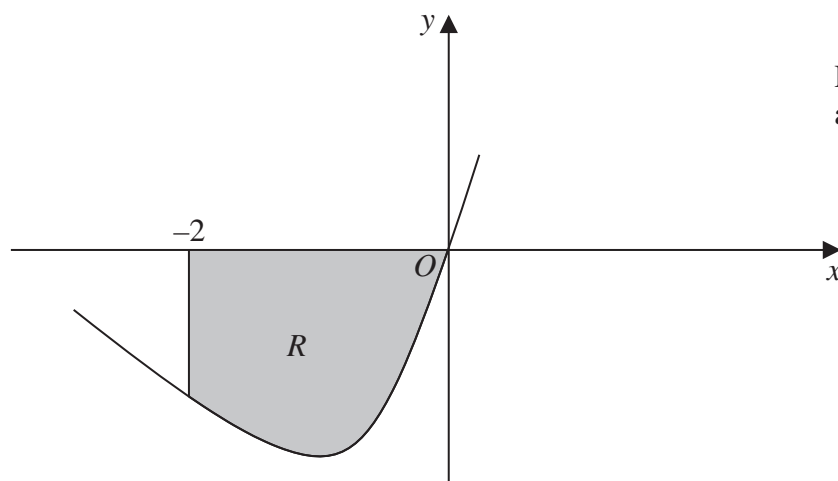


Diagram **NOT**
accurately drawn

Figure 2

Figure 2 shows part of the curve C with equation $y = 3xe^{2x}$

The finite region R bounded by C , the straight line with equation $x = -2$ and the x -axis, shown shaded in Figure 2, is rotated through 360° about the x -axis.

(b) Using part (a), find the volume, to 2 significant figures, of the solid formed.

(4)

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Question 11 continued

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(Total for Question 11 is 9 marks)

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