

1. Given that $y = x^4 + 6x^{\frac{1}{2}}$, find in their simplest form

$$(a) \quad \frac{dy}{dx} \tag{3}$$

$$(b) \int y \, dx \tag{3}$$



Q1

(Total 6 marks)





Question 2 continued

(Total 6 marks)

Q2



3. Find the set of values of x for which

(a) $4x - 5 > 15 - x$

(2)

(b) $x(x-4) > 12$

(4)



Question 3 continued

Lined area for writing the answer to Question 3.

Q3

Mark box for Question 3.

(Total 6 marks)



4. A sequence $x_1, x_2, x_3, \dots$ is defined by

$$x_1 = 1$$

$$x_{n+1} = ax_n + 5, \quad n \geq 1$$

where a is a constant.

- (a) Write down an expression for x_2 in terms of a .

(1)

- (b) Show that $x_3 = a^2 + 5a + 5$

(2)

Given that $x_3 = 41$

- (c) find the possible values of a .

(3)



Question 4 continued

(Total 6 marks)

Q4



Question 5 continued

Q5

(Total 8 marks)



6.

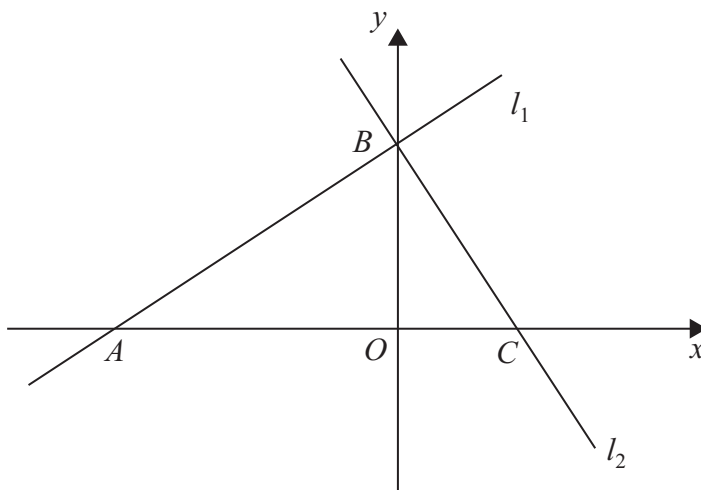


Figure 1

The line l_1 has equation $2x - 3y + 12 = 0$

- (a) Find the gradient of l_1 . (1)

The line l_1 crosses the x -axis at the point A and the y -axis at the point B , as shown in Figure 1.

The line l_2 is perpendicular to l_1 and passes through B .

- (b) Find an equation of l_2 .

The line l_2 crosses the x -axis at the point C .

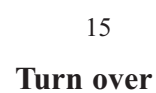
- (c) Find the area of triangle ABC . (4)







Q6



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)



Question 7 continued

(Total 5 marks)

Q7

--	--









Question 8 continued

Q8

(Total 10 marks)









Question 9 continued

(Total 9 marks)

Q9

--	--



10.

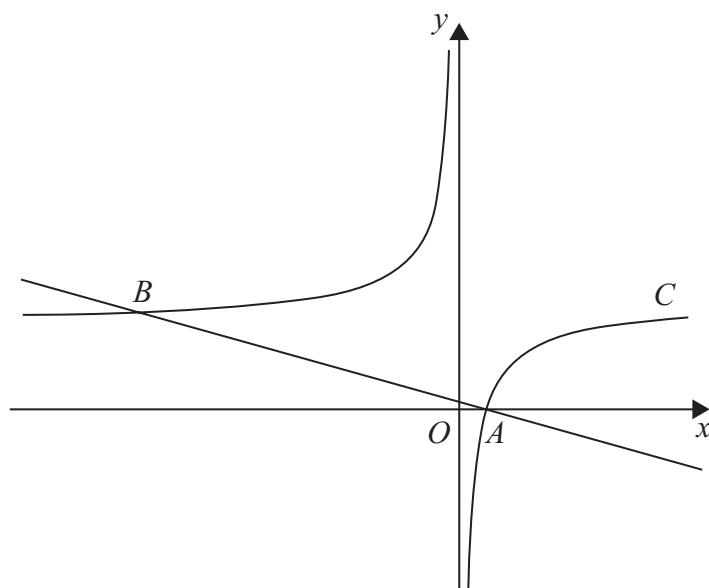


Figure 2

Figure 2 shows a sketch of the curve C with equation

$$y = 2 - \frac{1}{x}, \quad x \neq 0$$

The curve crosses the x -axis at the point A .

(a) Find the coordinates of A .

(1)

(b) Show that the equation of the normal to C at A can be written as

$$2x + 8y - 1 = 0$$

(6)

The normal to C at A meets C again at the point B , as shown in Figure 2.

(c) Find the coordinates of B .

(4)





Question 10 continued

Handwriting practice area with 30 horizontal lines.

Q10

--	--

(Total 11 marks)

TOTAL FOR PAPER: 75 MARKS

END

