

5.

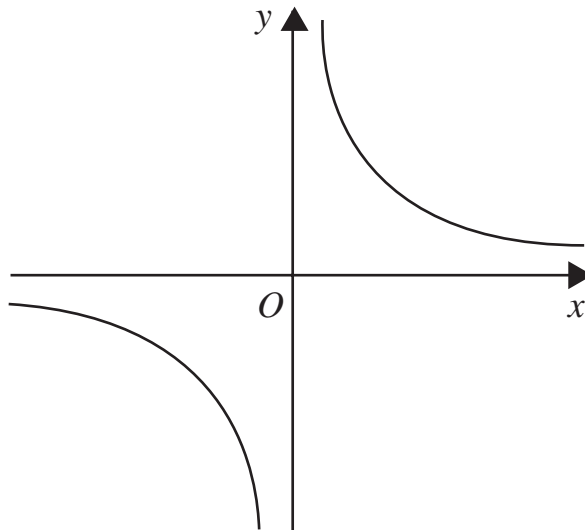
**Figure 1**

Figure 1 shows a sketch of the curve with equation $y = \frac{3}{x}$, $x \neq 0$.

- (a) On a separate diagram, sketch the curve with equation $y = \frac{3}{x+2}$, $x \neq -2$,
showing the coordinates of any point at which the curve crosses a coordinate axis. **(3)**
- (b) Write down the equations of the asymptotes of the curve in part (a). **(2)**



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Question 6 continued

Lined writing area for Question 6 continued, consisting of 28 horizontal lines.

Q6

(Total 7 marks)



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Question 7 continued

Lined area for writing the answer to Question 7.

(Total 6 marks)

Q7



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8. A sequence a_1, a_2, a_3, \dots is defined by

$$a_1 = k,$$

$$a_{n+1} = 3a_n + 5, \quad n \geq 1,$$

where k is a positive integer.

(a) Write down an expression for a_2 in terms of k . (1)

(b) Show that $a_3 = 9k + 20$. (2)

(c) (i) Find $\sum_{r=1}^4 a_r$ in terms of k .

(ii) Show that $\sum_{r=1}^4 a_r$ is divisible by 10. (4)



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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)

Horizontal lines for sketching the curve C.



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Question 10 continued

Handwriting lines for the answer to Question 10.

Q10

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(Total 13 marks)



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11. The line l_1 has equation $y = 3x + 2$ and the line l_2 has equation $3x + 2y - 8 = 0$.

- (a) Find the gradient of the line l_2 . **(2)**

The point of intersection of l_1 and l_2 is P .

- (b) Find the coordinates of P . **(3)**

The lines l_1 and l_2 cross the line $y = 1$ at the points A and B respectively.

- (c) Find the area of triangle ABP . **(4)**



