

5.

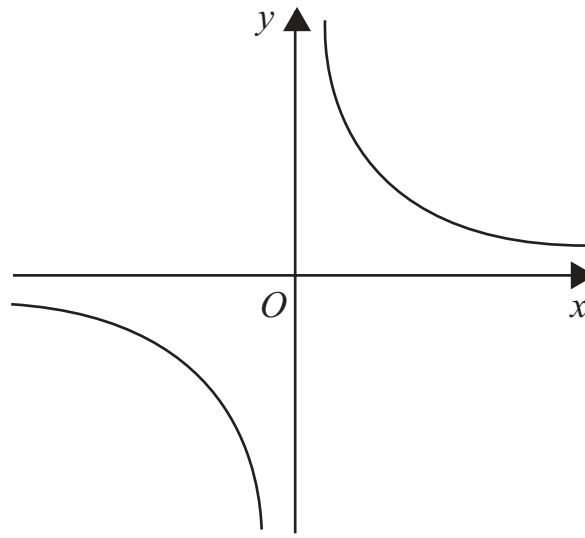


Figure 1

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 5 continued

Horizontal lines for writing.

Q5

(Total 5 marks)



6. (a) By eliminating y from the equations

$$y = x - 4,$$

$$2x^2 - xy = 8,$$

show that

$$x^2 + 4x - 8 = 0.$$

(2)

(b) Hence, or otherwise, solve the simultaneous equations

$$y = x - 4,$$

$$2x^2 - xy = 8,$$

giving your answers in the form $a \pm b\sqrt{3}$, where a and b are integers.

(5)



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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)



Question 9 continued

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(Total 9 marks)

Q9



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Question 10 continued

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Q10

(Total 13 marks)



