9 A curve C has equation $y = \dfrac{3 - 2x}{x + 6}$ where $x \neq -6$

(a) Write down an equation of the asymptote to C that is parallel to the

    (i) x-axis   (ii) y-axis

(2)

(b) Find the coordinates of the point where C crosses the

    (i) x-axis   (ii) y-axis

(2)

(c) Using the axes opposite, sketch the graph of C, showing clearly its asymptotes and the coordinates of the points where C crosses the coordinate axes.

(3)

(d) Show that the gradient of the tangent to C is always negative.

(3)

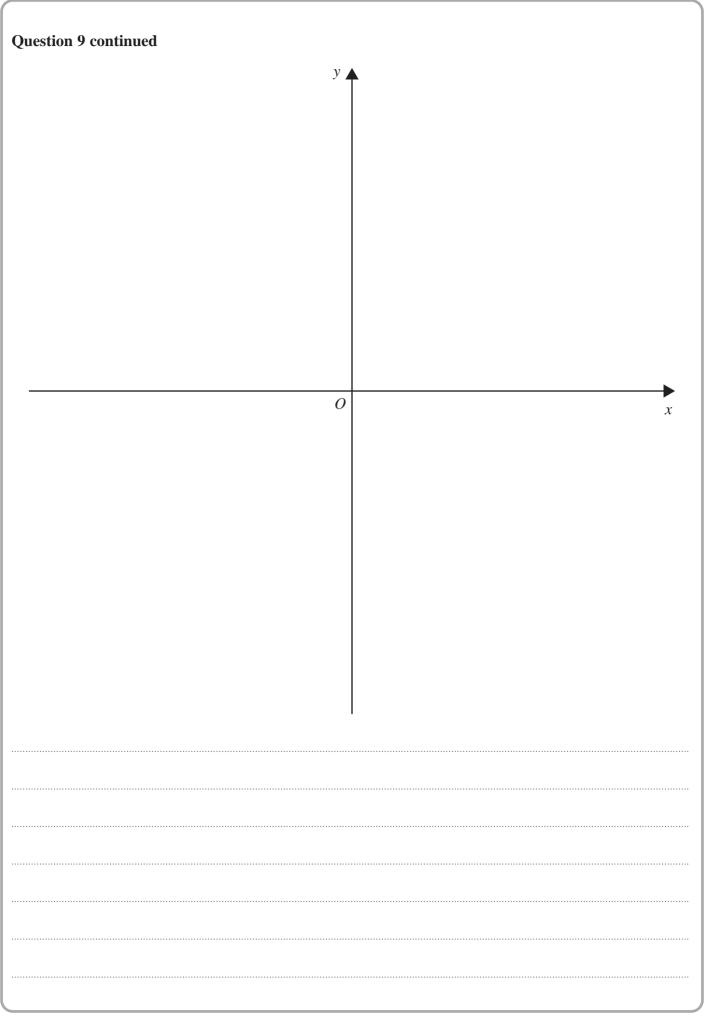A tangent to C has equation $y = -\dfrac{3}{5}x + k$ where $k > 0$

(e) Find the value of k

(5)

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Question 9 continued

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x

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P 7 4 2 8 4 A 0 2 5 3 2

Question 9 continued

P 7 4 2 8 4 A 0 2 6 3 2

Question 9 continued

(Total for Question 9 is 15 marks)

P 7 4 2 8 4 A 0 2 7 3 2