12.

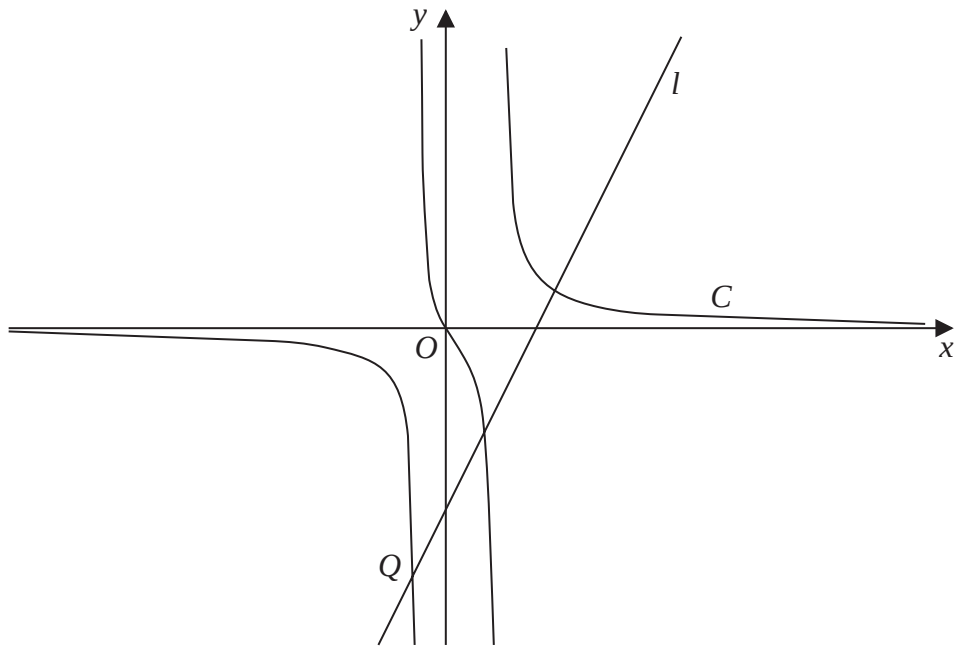

Figure 3

Figure 3 shows a sketch of the curve C with equation

$$y = \frac{15x}{(2x + 3)(x - 3)} \qquad x \neq -\frac{3}{2} \quad x \neq 3$$

and the straight line l with equation

$$y = 2x - 10$$

(a) Verify that C and l intersect where $x = 6$

(2)

The curve and line also intersect at the point Q shown in Figure 3.

(b) Show that the x coordinate of Q is a solution of

$$4x^3 - 26x^2 - 3x + 90 = 0$$

(2)

(c) Using algebra and showing all stages of working, find the exact x coordinate of Q.

(4)