7 The curve G has equation $y = 3 - \dfrac{1}{x-1}$, $x \neq 1$

(a) Find an equation of the asymptote to G which is parallel to

(i) the x-axis,

(ii) the y-axis.

(2)

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

(i) the x-axis,

(ii) the y-axis.

(2)

(c) Sketch G, showing clearly the asymptotes and the coordinates of the points where the curve crosses the coordinate axes.

(3)

A straight line l intersects G at the points P and Q. The x-coordinate of P and the x-coordinate of Q are roots of the equation $2x - 3 = \dfrac{1}{x-1}$

(d) Find an equation of l.

(2)

Question 7 continued

(Total for Question 7 is 9 marks)