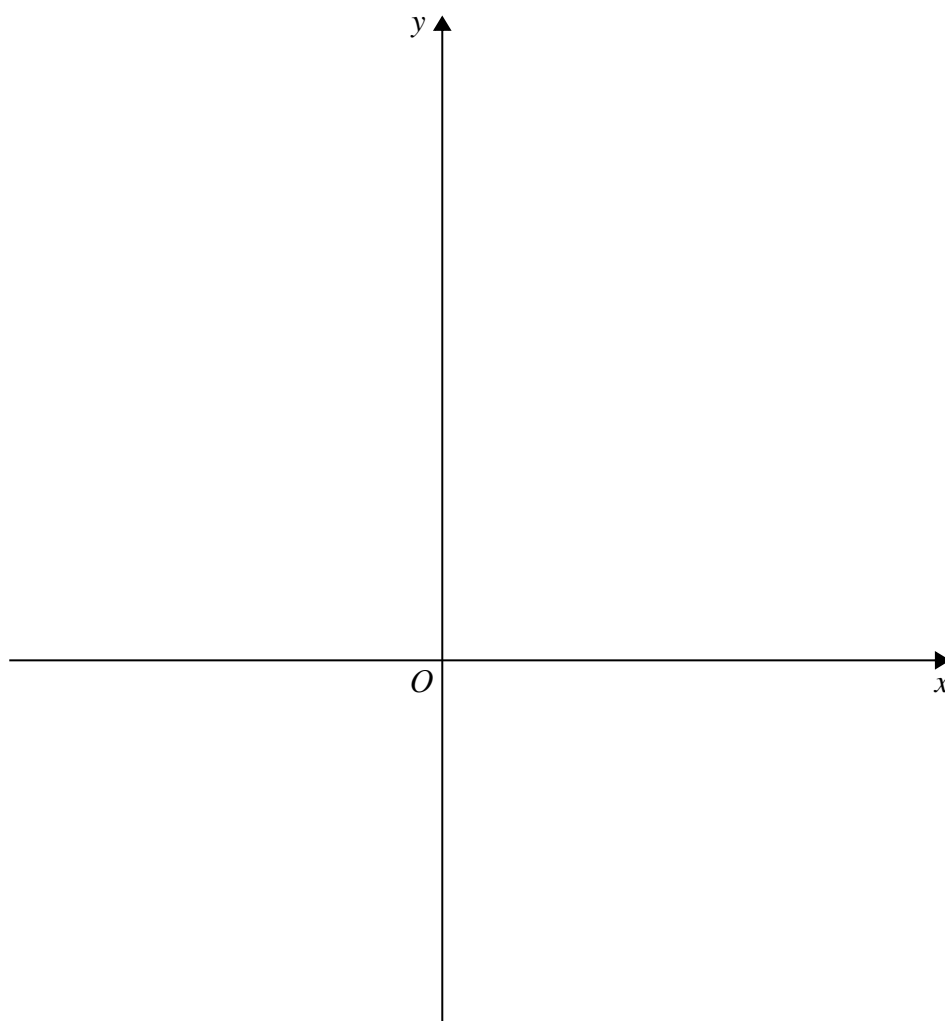**7** The curve C with equation

$$y = \frac{ax - 5}{x - b}$$

where a and b are integers, crosses the x-axis at the point $(2.5, 0)$. The asymptote to C which is parallel to the y-axis has equation $x = 1$

(a) (i) Show that $a = 2$

  (ii) Find the value of b.

  (3)

(b) Find the coordinates of the point where C crosses the y-axis.

  (1)

(c) Find the equation of the asymptote to C which is parallel to the x-axis.

  (1)

(d) Using the axes below, sketch the curve C showing clearly the asymptotes and the coordinates of the points where C crosses the coordinate axes.

  (3)

Question 7 continued

(Total for Question 7 is 8 marks)