

FP1 Graphs Rational Functions Questions

4 A curve has equation

$$y = \frac{6x}{x-1}$$

- (a) Write down the equations of the two asymptotes to the curve. (2 marks)
- (b) Sketch the curve and the two asymptotes. (4 marks)
- (c) Solve the inequality

$$\frac{6x}{x-1} < 3 \quad (4 \text{ marks})$$

9 A curve C has equation

$$y = \frac{(x+1)(x-3)}{x(x-2)}$$

- (a) (i) Write down the coordinates of the points where C intersects the x -axis. (2 marks)
- (ii) Write down the equations of all the asymptotes of C . (3 marks)
- (b) (i) Show that, if the line $y = k$ intersects C , then

$$(k-1)(k-4) \geq 0 \quad (5 \text{ marks})$$

- (ii) Given that there is only one stationary point on C , find the coordinates of this stationary point.

(No credit will be given for solutions based on differentiation.) (3 marks)

- (c) Sketch the curve C . (3 marks)
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5 A curve has equation

$$y = \frac{x}{x^2 - 1}$$

(a) Write down the equations of the three asymptotes to the curve. (3 marks)

(b) Sketch the curve.

(You are given that the curve has no stationary points.) (4 marks)

(c) Solve the inequality

$$\frac{x}{x^2 - 1} > 0 \quad (3 \text{ marks})$$

7 A curve has equation

$$y = \frac{3x - 1}{x + 2}$$

(a) Write down the equations of the two asymptotes to the curve. (2 marks)

(b) Sketch the curve, indicating the coordinates of the points where the curve intersects the coordinate axes. (5 marks)

(c) Hence, or otherwise, solve the inequality

$$0 < \frac{3x - 1}{x + 2} < 3 \quad (2 \text{ marks})$$
