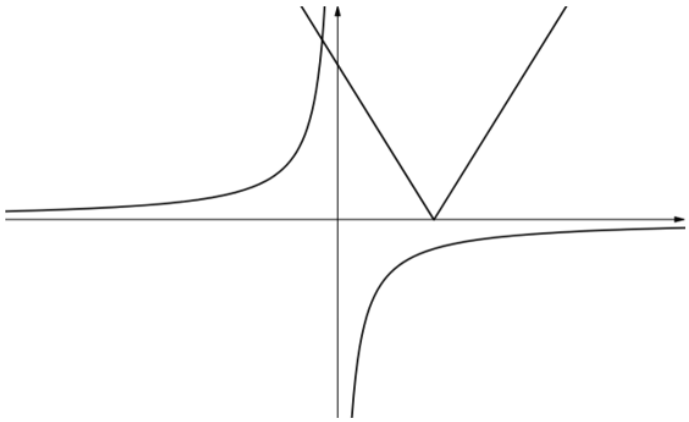
Question	Scheme	Marks	AOs
10	Sketch for (a) and (b) 		
(a)	V-shape anywhere on the sketch.	B1	1.1b
	• V-shape touching the positive x-axis • $(0,4)$ and $\left(\frac{4}{a},0\right)$ labelled in the correct places	B1	1.1b
		(2)	
(b)(i)	Correct sketch in quadrants 2 and 4 with acceptable asymptotes.	B1	1.1b
(ii)	The graphs intersect once (and so there is one solution to the equation).	B1ft	2.4
		(2)	
(c)(i)	$x(4-3x)+1=0$	M1	3.1a
	$3x^2-4x-1=0 \Rightarrow x=\frac{2\pm\sqrt{7}}{3}$	A1	1.1b
	$x=\frac{2-\sqrt{7}}{3}$	A1	2.3
(ii)	Deduces $x \ldots \frac{2-\sqrt{7}}{3}$ or $x>0$	M1	2.2a
	$\left\{x : x \leqslant "\frac{2-\sqrt{7}}{3}"\right\} \cup \{x : x>0\}$	A1ft	2.5
		(5)	
			(9 marks)

Notes:

(a)

B1B1: See main scheme.

(b)(i)

B1: Correct sketch in quadrants 2 and 4 with acceptable asymptotes (which may be implied). Asymptotes do not need to be labelled.

(b)(ii)

B1ft: See main scheme but allow follow through on their number of intersections as long as their modulus graph is V shaped and reciprocal graph would satisfy $y = \pm\frac{k}{x}$

(c)(i)

M1: Multiplies by x and attempts to create a 3TQ using the negative branch of the modulus graph. If both branches are attempted then this mark is available, but if only the positive branch is attempted then score M0.

Expect to see $x(4-3x)+1=0$ and then the brackets expanded.

A1: $x = \frac{2\pm\sqrt{7}}{3}$ o.e. Finds at least one correct solution to the correct quadratic $3x^2-4x-1=0$ which may come directly from their calculator.

A1: $x = \frac{2-\sqrt{7}}{3}$ or $x = \frac{2}{3}-\frac{\sqrt{7}}{3}$ only. The other solution must be rejected.

(c)(ii)

M1: Deduces either end $x\ldots"\frac{2-\sqrt{7}}{3}"$ or $x>0$ Ignore any inequality or equality for their solution to (c)(i) but the inequality must be correct for 0.

A1ft: $\left\{x : x \leqslant "\frac{2-\sqrt{7}}{3}"\right\} \cup \{x : x > 0\}$ following through on their answer to (c)(i) as long as it is in exact form.