

Question	Scheme	Marks	AOs
11 (a)	Attempts $f\left(\frac{5}{3}\right) = \frac{2+3 \times \frac{5}{3}}{\frac{5}{3}} =$ or attempts to solve $\frac{2}{a-3} = \frac{5}{3}$	M1	3.1a
	$\frac{21}{5}$ oe	A1	1.1b
		(2)	
(b)	$\frac{2+3x}{x} < \frac{3}{2} \Rightarrow x < -\frac{4}{3}$	M1	3.1a
	There are no values as f is only defined for $x > 0$	A1	3.2a
		(2)	
(c)	Attempts $f'(x) = \frac{x \times 3 - (2+3x)}{x^2}$	M1	1.1b
	$f'(x) = \frac{-2}{x^2} < 0$ so f is decreasing for all values of x	A1	2.4
		(2)	

(6 marks)

Notes:

(a)

M1: For a valid method. Accept an attempt at $f\left(\frac{5}{3}\right)$ or else an attempt to find $f^{-1}(a)$ by change of subject

followed by an attempt at solving $f^{-1}(a) = \frac{5}{3}$

A1: $\frac{21}{5}$

(b)

M1: Attempts to solve $f(x) < \frac{3}{2}$ or sketches graph and shows the

asymptote. Alt writes $f(x) = 3 + \frac{2}{x}$ and states $f > 3$

A1: States that there are no values and gives a valid reason. When using a graphical solution "stating $f(x) > 3$ hence there are no

values for $f(x) < \frac{3}{2}$ " is sufficient.

(c)

M1: Award for an attempt to find $f'(x)$ using the quotient rule or via an explanation involving the

changed function $f(x) = 3 + \frac{2}{x}$ (As x increases $\frac{2}{x}$ decreases...)

A1: Requires a correct calculation and explanation

