Question	Scheme	Marks	AOs
6	Assume there exists a positive real value of $x$ for which	54	
	$x + \frac{4}{x} < 4$	BI	2.5
	$x + \frac{4}{x} < 4 \Longrightarrow x^2 + 4 < 4x \Longrightarrow x^2 - 4x + 4 < 0$	M1	3.1a
	$x^2 - 4x + 4 < 0 \Longrightarrow \left(x - 2\right)^2 < 0$	M1	2.1
	Which is a contradiction as $(x-2)^2 \ge 0$		
	So $x + \frac{4}{x} \ge 4$	A1	2.4
		(4)	
ALT	Assume there exists a positive real value of x for which		
	$x + \frac{4}{x} < 4$	B1	2.5
	$x + \frac{4}{x} < 4 \Rightarrow x^{2} + 8 + \frac{16}{x^{2}} < 16 \Rightarrow x^{2} - 8 + \frac{16}{x^{2}} < 0$	M1	3.1a
	$\Rightarrow x^2 - 8 + \frac{16}{x^2} < 0 \Rightarrow \left(x - \frac{4}{x}\right)^2 < 0$	M1	2.1
	Which is a contradiction as $\left(x - \frac{4}{x}\right)^2 \ge 0$ So $x + \frac{4}{x} \ge 4$	A1	2.4
	λ	(4)	
		(4	marks)
Notes (this must be a proof by contradiction)			
B1: For using correct language and notation to set up the contradiction			
M1: Recognises the requirement to multiply though by $x$ and collects terms to one side			
M1: Uses appropriate algebra to progress to the contradiction			
A1: Full and rigorous argument using fully correct algebra with a conclusion			
ALT D1 Francisco como et la seconda de sectore de contra distina			
B1: For using correct language and notation to set up the contradiction M1: Recognises the requirement to squares both sides and collects terms to one side			
M1. Exclogenses the requirement to squares both sides and confects terms to one side			
min. Oses appropriate algebra to progress to the contradiction			

A1: Full and rigorous argument using fully correct algebra with a conclusion