

Question			Answer	Marks	AO	Guidance
9	(a)		$f(1) = -1$	B1	1.1	Finding $f(1)$ or $f(2)$
			$f(2) = 13.75$ or $\frac{55}{4}$ so there is a change of sign	B1	1.1	Completion to show change of sign with explanation.
				[2]		
9	(b)		Value of x in the range $1.125 < x < 1.25$	B1	2.2a	Any value in this range. Candidates may give the range.
				[1]		
9	(c)		$f(1.15) = -0.09$ so $x \approx 1.2$ (cao)	B1	2.2a	Justified by their calculations(which may not necessarily use 1.15).
				[1]		
9	(d)	(i)	There is a change of sign;	E1	2.4	Incorrect maths (e.g. it implies a y-intercept) B0
				[1]		
9	(d)	(ii)	Clear and correct explanation	E1	2.4	E.g. - The function is undefined for $x = \frac{2}{3}$ [and it looks as if the spreadsheet is homing in on this value] - Accept ‘discontinuous’ or ‘asymptote’ for ‘undefined’ - Fig. 9.1 shows that there is only one root. - Could refer to the table (e.g. $f(x)$ values diverging) isw after a correct answer
				[1]		

Q9a. The first B mark is for finding either $f(1)$ or $f(2)$. The second B mark is for finding the other value AND saying there is a sign change.

Q9b. Any value between 1.125 and 1.25 will do for this mark. Some candidates are just halving the range and using 1.0625 which scores B0.

Q9c. They must give a value for, say $f(1.15) = -0.09$, (or $f(1.15625) = -0.0496$, $f(1.16) = -0.025$, $f(1.163) = -0.05$, $f(1.164) = 0.0015$), and a final value of 1.2. The question asks for 1dp so only accept 1.2. 1.2 with no other working scores B0. Other values for f are possible.

Q9di. A change in sign is all that is required here.

Q9dii. We are allowing various comments. See the MS guidance. ISW after a correct answer has been seen.