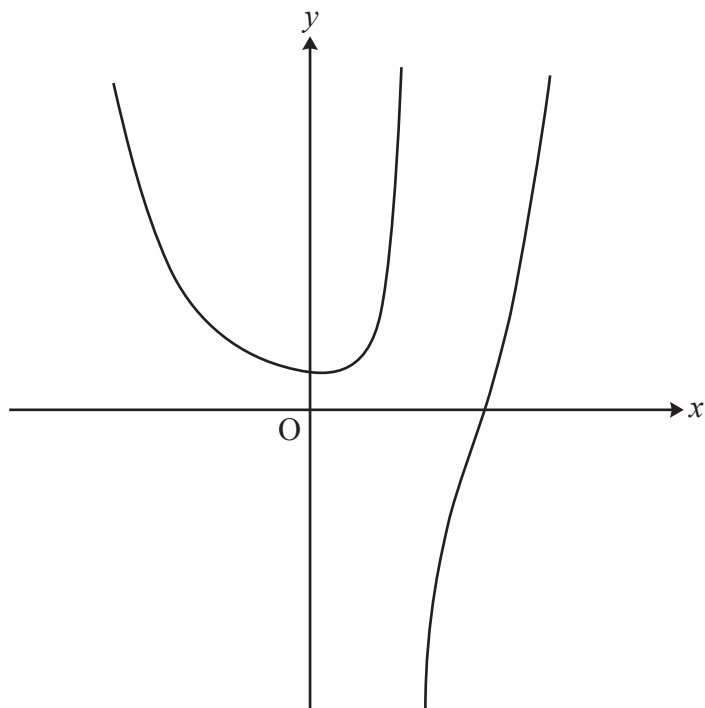**9** This question is about the equation $f(x) = 0$, where $f(x) = x^4 - x - \dfrac{1}{3x-2}$.

Fig. 9.1 shows the curve $y = f(x)$.

Fig. 9.1

(a) Show, by calculation, that the equation $f(x) = 0$ has a root between $x = 1$ and $x = 2$. **[2]**

(b) **Fig. 9.2** shows part of a spreadsheet being used to find a root of the equation.

Fig. 9.2

	A	B
1	x	f(x)
2	1.5	3.1625
3	1.25	0.619977679
4	1.125	-0.250466087
5		

Write down a suitable number to use as the next value of x in the spreadsheet. **[1]**

(c) Determine a root of the equation $f(x) = 0$. Give your answer correct to **1** decimal place. **[1]**

(d) **Fig. 9.3** shows a similar spreadsheet being used to search for another root of $f(x) = 0$.

Fig. 9.3

	A	B
1	x	f(x)
2	0	0.5
3	1	-1
4	0.5	1.5625
5	0.75	-4.4336
6	0.6	4.5296
7	0.7	-10.4599
8	0.65	19.5285
9	0.675	-40.4674
10	0.6625	79.5301
11	0.66875	-160.4687
12		

(i) Explain why it looks from rows 2 and 3 of the spreadsheet as if there is a root between 0 and 1. **[1]**

(ii) Explain why this process will **not** find a root between 0 and 1. **[1]**