



a Does $x^3 + 4x = 9$ have a solution between 1 and 2? <i>yes: -4 then 7</i> rearrange to zero, then a sign change	b How many roots does $x^3 - 3x + 1 = 0$ have between -2 and 2? 3 count the changes of sign	c Find the two 1 dp numbers either side of the root of $x^3 + 4x - 9 = 0$ 1.4 and 1.5 a search to 1 decimal place	d Find the root of $x^3 + 4x - 9 = 0$ to 1 decimal place 1.5 test the halfway value to round
e Show that $x^3 + 4x - 9 = 0$ can be written as $x = \frac{9}{x^2 + 4}$ $x(x^2 + 4) = 9$ rearrange by factorising out x	f $x_1 = 1.5$. Use $x_{n+1} = \frac{9}{x_n^2 + 4}$ to find x_2 1.44 x(n) in the denominator	g $x_1 = 1.5$. Use $x_{n+1} = \frac{9}{x_n^2 + 4}$ to find x_4 to 3 decimal places 1.453 three steps: keep full values	h Explain why $x_1 = 0$ cannot be used with $x_{n+1} = 2 + \frac{5}{x_n^2}$ <i>you cannot divide by 0</i> a start value that fails
i Which cubic equation does $x_{n+1} = 2 + \frac{5}{x_n^2}$ solve? $x^3 - 2x^2 - 5 = 0$ the equation: multiply through by x^2	j $x_1 = 3$. Iterate $x_{n+1} = 2 + \frac{5}{x_n^2}$ to find the root to 2 decimal places 2.69 iterate a fraction formula to a root	k $x_1 = 1$ and $x_{n+1} = \sqrt{x_n + 6}$. Find the exact value x_n settles at 3 where it settles: solve $x = g(x)$	l Find the negative root of $x^3 - 3x + 1 = 0$ to 1 decimal place -1.9 a negative root to 1 dp

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