

Solutions

Each answer shows the steps, then the **result**.

2.1

- $f(0) = 1$, $f(1) = 1 - 5 + 1 = -3$; opposite signs, so a root lies between 0 and 1

2.2

- $x_{n+1} = \cos x_n$

3.1 B

- Opposite signs (with a continuous graph) trap a root between them

3.2

(a)

- $f(0) = 2 > 0$, $f(1) = 1 - 6 + 2 = -3 < 0$; opposite signs
- root between 0 and 1

(b)

- $x^3 - 6x + 2 = 0 \Rightarrow 6x = x^3 + 2 \Rightarrow x = \frac{x^3 + 2}{6}$; $x_1 = \frac{0.027 + 2}{6} = 0.3378$, $x_2 = 0.3397$, $x_3 = 0.3398$; $\alpha = 0.34$

3.3

- there could be several roots between a and b — the graph may cross the axis more than once (an odd number of times)