



In the following problems, find the root as specified using the regula-falsi method (method of false position).

1. Find the positive root of $x^3 = 2x + 5$. (Do only four iterations). (A.U. Nov./Dec. 2006)
2. Find an approximate root of $x \log_{10} x - 1.2 = 0$.
3. Solve the equation $x \tan x = -1$, starting with $a = 2.5$ and $b = 3$, correct to three decimal places.
4. Find the root of $xe^x = 3$, correct to two decimal places.
5. Find the smallest positive root of $x - e^{-x} = 0$, correct to three decimal places.
6. Find the smallest positive root of $x^4 - x - 10 = 0$, correct to three decimal places.

In the following problems, find the root as specified using the Newton-Raphson method.

7. Find the smallest positive root of $x^4 - x = 10$, correct to three decimal places.
8. Find the root between 0 and 1 of $x^3 = 6x - 4$, correct to two decimal places.
9. Find the real root of the equation $3x = \cos x + 1$. (A.U. Nov./Dec. 2006)
10. Find a root of $x \log_{10} x - 1.2 = 0$, correct to three decimal places. (A.U. Nov./Dec. 2004)
11. Find the root of $x = 2 \sin x$, near 1.9, correct to three decimal places.
12. (i) Write an iteration formula for finding \sqrt{N} where N is a real number. (A.U. Nov./Dec. 2006, A.U. Nov./Dec. 2003)
(ii) Hence, evaluate $\sqrt{142}$, correct to three decimal places.

Determine the solution of the equation $8 - \frac{9}{2}(x - \sin x) = 0$ by using the Bisection method accurate to five decimal places in the interval (2, 3).

Find the root of $\log x = \cos x$ correct to two decimal places using Bisection method.

Use the Bisection method to find a root of the equation $x^3 - 4x - 9 = 0$ in the interval (2, 3), accurate to four decimal places.

Use the Bisection method to determine a root correct to three decimal places of the equation $x \log_{10} x = 1.2$. Interval (2, 3).

Use the Bisection method to find a root of the equation $4.905t^2 - 15t + 5 = 0$ in the interval (0.3, 0.4) with an accuracy of 4 digits.

Use Bisection method to find the root of $f(x) = x^3 - 10x^2 + 5 = 0$ that lies in the interval (0.6, 0.8) correct within four decimal places.

Use Bisection method to find the root of $f(x) = x - \tan x$ in the interval (7, 8) correct to four decimal places.

Use Bisection method to find the smallest positive root of $\cos x = \frac{1}{2} + \sin x$ in the interval (0.41, 0.43).

Use an error tolerance of $\epsilon = 0.0001$.

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