1. Find \( x \) to 3 decimal places if \( \log_2 x + \log_x 2 = 10/3 \).

2. Simplify \( \sqrt[3]{x^{7/2}x^{-1/3}} \).

3. If \( f(x + 3) = x^2 \) find the formula for \( f(x) \).

4. Find all solutions of \( |2 - x| = 1 - 3x \).

5. For which values of \( \alpha \) does the series \( \sum_{n=0}^{\infty} \frac{n}{n^\alpha + 1} \) converge?

6. Evaluate \( \lim_{x \to 0} x \ln x \).

7. Evaluate \( \lim_{n \to \infty} \left( \frac{2}{n} - \frac{n}{n^2 + 1} \right) \).

8. Find all the eigenvalues of \( A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 3 & 0 \\ 4 & 5 & 6 \end{bmatrix} \).

9. Calculate \( \int x \sin x \, dx \).

10. Find the volume of a donut obtained by the revolution of the circle \((x - 2)^2 + y^2 = 1\) about \( y \)-axis.

11. Give an example of a function that is continuous at \( x = 0 \) but has no derivative there. Give an example of a function that has a derivative at \( x = 0 \) but is discontinuous there.

12. Write the MacLaurin polynomial of degree 3 for \( f(x) = e^x + \sin x \).

13. Find the inverse function of \( f(x) = \ln \frac{1 + x}{1 - x} \) and determine the domain and the range of the inverse function.

14. Evaluate \( \lim_{x \to 0} \frac{\sqrt{x + 4} - 2}{x} \).