

MOCK QUIZ 3

Problem 1. *Compute*

$$\lim_{x \rightarrow 0} \frac{\frac{1}{2} + \frac{x}{16} - \frac{1}{\sqrt{4-x}}}{x^2}$$

by expanding $\frac{1}{\sqrt{4-x}}$ as a Maclaurin series.

Problem 2. *Evaluate $\int_0^1 \sin(x^2) dx$ correct to within an error of 0.001. [Hint: Use Taylor expansion, then use the Alternating Estimation Theorem.]*

Problem 3. Solve the differential equation $\frac{dy}{dx} = \frac{xy^2\sqrt{1+x^2}}{\ln y}$.

Problem 4. Exercise 2, Section 9.4.

Problem 5. Solve the first-order linear differential equation $xy' + y = \sqrt{x}$.