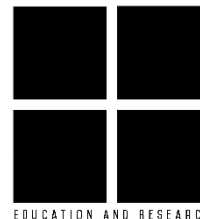


UP SCHOOL OF STATISTICS STUDENT COUNCIL

Education and Research



erho.weebly.com | erhomyhero@gmail.com | [/erhoismyhero](https://www.facebook.com/erhoismyhero) | [@erhomyhero](https://www.instagram.com/erhomyhero)

Mathematics 54
First Long Exam

M54_LE1_001
Elementary Analysis II
First Semester, AY 2016-2017

General Instructions: This examination is good for **90 minutes** only. Show neat and necessary solutions and box all your final answers to gain full credit. Use **black or blue non-erasable ink** only. The use of electronic devices such as mobile phones or calculators is strictly prohibited. **Any form of cheating in examinations or any act of intellectual dishonesty in relation to studies, such as plagiarism, shall be subject to disciplinary action.**

I. Evaluate the following integrals. (6 points each)

$$\begin{array}{lll} 1. \int_{\frac{1}{2}}^1 x^4 \ln(2x) dx & 3. \int \frac{1}{x^2 \sqrt{x^2 + 4}} dx & 5. \int_{-\infty}^0 \frac{e^{1/x}}{x^2} dx \\ 2. \int \sin^5(3x) \cos^2(3x) dx & 4. \int \frac{3x^2 + 4x + 4}{x(x^2 + 4)} dx & \end{array}$$

II. Find the equation of the curve that passes through the point $(1, \ln(2e + 1))$ whose slope at any point (x, y) is given by

$$\frac{dy}{dx} = 2e^{x-y} \quad (5 \text{ points})$$

III. Find the orthogonal trajectories for the family of sinusoids given by

$$y = k \sin(x), \quad k \in \mathbb{R}. \quad (5 \text{ points})$$

- END OF EXAM -
Total: 40 points