



Mathematics 54
First Long Exam

M54-LE1-003
Elementary Analysis II
First Semester, AY 2014 -2015

Direction: Do as indicated. Show complete and clear solution to get full points. Box your final answers.

1. Evaluate the following integrals. (7 points each)

i. $\int_0^{\pi/6} x \tan^2 3x \, dx$

ii. $\int \frac{2x^2 - 2x - 1}{x^3 - x^2} \, dx$

iii. $\int \frac{1}{x^2 \sqrt{9 - 4x^2}} \, dx$

iv. $\int_0^{\infty} \frac{e^{-\sqrt{x}}}{\sqrt{x}} \, dx$

2. Find the orthogonal trajectories for the family of curves, $\sin^2 y = k \ln x$. (6 points)

3. Solve the differential equation. (6 points)

$$\frac{y' \cos y}{\sin x} = \frac{x^2}{\sin^2 y}$$

- END OF EXAM -