

King Fahd Univ. of Petroleum and Minerals
Faculty of Sciences
Department of Mathematical Sciences

MAJOR No. 3
(MATH. 102-042 Sections 1 & 2)

Name:

ID:

Prob. 1

Determine whether the series is convergent or divergent

$$\sum_{k=1}^{+\infty} \frac{e^{1/k}}{k^2}$$

Prob. 2

Compute $\sin \frac{\pi}{10}$ to 6 decimal places

Prob. 3

Determine the nature (convergence, divergence) of the series
a)

$$\sum_{k=1}^{+\infty} (k!)k^{k^k}$$

b)

$$\sum_{k=2}^{+\infty} \frac{k}{(\ln k)^k}$$

Prob. 4

Compute $\int_{-1}^8 \frac{dx}{\sqrt[3]{x}}$

Prob. 5

Show that the sequence $\left\{ (2^n + 3^n)^{\frac{1}{n}} \right\}_{n=1}^{+\infty}$ is convergent