

King Fahd Univ. of Petroleum and Minerals
Faculty of Sciences
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MAJOR No. 3
(MATH. 101-041 Sections 4 & 8)

Name:
ID:

Prob. 1

Prove that if $m^2 + sn \neq 0$, then the graph of $h(u) = \frac{mu+n}{su-m}$ is symmetric about the line $v = u$.

Prob. 2

Find the limit $\lim_{t \rightarrow 1} \frac{\ln w}{w-1}$

Prob. 3

Prove that $\sec^{-1} x + \sec^{-1}(-x) = \pi$

Prob. 4

Find the limit $\lim_{w \rightarrow +\infty} [\cos(7/w)]^{w^2}$

Prob. 5

- (a) Show that $e^x \geq 1 + x$, if $x \geq 0$.
(b) Show that $e^x \geq 1 + x + \frac{x^2}{2}$, if $x \geq 0$.