NAME: .....LAB TIME: .....

MATH 121 - CALCULUS I

PRACTICE TEST II

Problem 1. Find local maxima and local minima, and sketch the graph of $f(x) = \dfrac{x-1}{x^2}$.

Problem 2. Find the following limits:

(1) $\lim_{x\to 1} \dfrac{1-x+\ln x}{1+\cos(\pi x)}$.

(2) $\lim_{x\to\infty}(e^x+x)^{\frac{1}{x}}$.

Problem 3. Find the point on the line $6x+y=9$ that is closest to the point $(-3,1)$.

Problem 4. Use Newton's method with starting point $x_1 = 1$ and $n = 3$ (i.e. find x_3) to approximate a solution to the equation $x^2 - x - 1 = 0$.

Problem 5. Find the following integrals:

(1) $\displaystyle\int \Big(\frac{4}{1+x^2} + \frac{1}{\sqrt{x}} - \cos x\Big)dx.$

(2) $\displaystyle\int_1^3 x^5\sqrt{1+x^2}dx.$