



**AFE
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**COLLEGE OF ENGINEERING
ENGINEERING MATHEMATICS I (ENG 281) ASSIGNMENT I**

*Given Date: 02/10/2017
Submission Date: 07/10/2017*

EXERCISE

1. Evaluate the following limits of function:

a. $\lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{\left(x^2 - \frac{\pi}{4} \right) \sin(\cos x)}{x - \frac{\pi}{2}} \right)$

b. $\lim_{x \rightarrow \frac{\pi}{2}} \ln \left(\exp \frac{(3x^2 + 2x - 1)}{x + 1} \right)$

c. $\lim_{x \rightarrow 2 + \sqrt{3}} \cos \left(\sin^{-1} \frac{(x - 2)}{(x - \sqrt{3})} \right)$

d. $\lim_{x \rightarrow 4} \left(\frac{x^2 - 8x + 16}{x^2 - 5x + 4} \right)$

2. Determine whether each of the following series is convergent:

a. $\frac{2}{2 \times 3} + \frac{2}{3 \times 4} + \frac{2}{4 \times 5} + \frac{2}{5 \times 6} + \dots$

b. $\frac{2}{1^2} + \frac{2}{2^2} + \frac{2}{3^2} + \frac{2}{4^2} + \dots$

c. $u_n = \frac{1 + 2n^2}{1 + n^2}$

3. Find the range of values of x for which the series below is absolutely convergent:

$$\frac{x}{27} + \frac{x^2}{125} + \dots + \frac{x^n}{(2n+1)^3}$$

4. Evaluate using L'Hopital's Rule:

$$\lim_{x \rightarrow 0} \left(\frac{\sin x - \cos x}{x^3} \right)$$