

AUC apCalculus BC

Assignment 08

PROBLEM 5.1. Study the convergence of the following series:

$$(1) \sum_{n=1}^{+\infty} (-1)^n n^5.$$

$$(2) \sum_{n=1}^{+\infty} \frac{1}{n} - \frac{1}{n+1}.$$

$$(3) \sum_{n=1}^{+\infty} \frac{1}{n^2} - \frac{1}{(n+1)^2}.$$

$$(4) \sum_{n=1}^{+\infty} \sin(n) - \sin(n+1).$$

$$(5) \sum_{n=n_0}^{+\infty} \frac{1}{10^n}.$$

$$(6) \sum_{n=1}^{+\infty} \frac{5}{10^n}.$$

$$(7) \sum_{n=1}^{+\infty} \frac{2^{n+2} - 3^{n+4}}{10^n}.$$

$$(8) \sum_{n=1}^{+\infty} \frac{1}{n(n+1)}.$$

$$(9) \sum_{n=1}^{+\infty} \frac{1}{n(n+1)(n+2)}.$$

$$(10) \sum_{n=1}^{+\infty} \frac{6^n}{7^n}.$$

PROBLEM 4.1. Prove that the following series diverge:

$$(1) \sum_{n=1}^{+\infty} (-1)^n n^3.$$

$$(2) \sum_{n=1}^{+\infty} (-1)^n \frac{n^2+1}{n+1}.$$

$$(3) \sum_{n=1}^{+\infty} (-1)^n \frac{n^5+1}{n^2+1}.$$

$$(4) \sum_{n=1}^{+\infty} \sin(n).$$