MATH 182 WORKSHEET V DR. MCLOUGHLIN SPRING 2012

1. Consider each of the following. Find each of the following using any method that is proper (reduce numerical results):

Let $k : \mathbb{N} \longrightarrow \mathbb{R} \ni k(n) = k_n$ be a well defined sequence of terms; $\sum_{n=1}^{\infty} k_n$ be the series associated with the sequence of terms $\{k_n\}_{n=1}^{\infty}$; and, $p : \mathbb{N} \longrightarrow \mathbb{R} \ni p(n) = p_n$ be the sequence of partial sums associated with the sequence of terms.

Determine if $\sum_{n=1}^{\infty} k_n$ converges or diverges. If it converges and one can find the sum using the technique one used; then please do so.

A. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{(1)^n}{n^2}$.

B. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{(-1)^n}{n^2}$.

C. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{1}{n^2}$.

D. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{\sin(n)}{n^2}$.

E. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{1}{2^n}$.

F. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{\sin(\frac{(2n-1)\pi}{2})}{n^2}$.

G. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{\cos(\frac{(2n-1)\pi}{2})}{n^2}$.

H. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{e^n}{n^2}$.

I. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{\ln(n)}{n^2}$.

J. Let $\sum_{n=1}^{\infty} k_n \ni \quad k_n = \dfrac{n^2}{e^n}$.

2. Consider each of the following. Find each of the following using any method that is proper (reduce numerical results):

Let $f : A \longrightarrow \mathbb{R} \ni f(n) = f_n$ and $A = \mathbb{N} \setminus \{1, 2\}$ be a well defined sequence of terms; $\sum_{n=3}^{\infty} f_n$ be the series associated with the sequence of terms $\{f_n\}_{n=3}^{\infty}$; and, $p : \mathbb{N} \longrightarrow \mathbb{R} \ni p(n) = p_n$ be the sequence of partial sums associated with the sequence of terms.

Determine if $\sum_{n=3}^{\infty} f_n$ converges or diverges. If it converges and one can find the sum using the technique one used; then please do so.

A Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{n^2 + 13n + 42}{n^3 + 6n^2 - 4n - 24}$.

B. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{(-1)^n (n^2 + 13n + 42)}{n^3 + 6n^2 - 4n - 24}$.

C. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{(n-3)!}{(n+2)!}$.

D. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{2^{(n-2)}}{3^{(n+1)}}$

E. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{n^2 + 13n + 42}{n^4 + 6n^3 - n^2 - 6n}$.

F. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{\pi^{(n-2)}}{3^{(n+1)}}$

G. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{e^{(n-2)}}{3^{(n+1)}}$.

H. Let $\sum_{n=3}^{\infty} f_n \ni \quad f_n = \dfrac{(2.9)^{(n-2)}}{3^{(n+1)}}$

End.