December 16,2012

QUIZ♯5 Math102-sec14.

Net Time Allowed: 20 minutes

Name: **ID ♯:** **Serial ♯:**

Exercise1: (07pts)

Determine whether the series $\sum_{n=1}^{\infty} \frac{3n^2+7n+4}{\sqrt{16\,n^4+3n+2}}$ is convergent or divergent. Justify your answer.

$\lim_{n\to\infty} \frac{3n^2+7n+4}{\sqrt{16n^4+3n+2}}$ (02) $= \lim_{n\to\infty} \frac{3n^2}{\sqrt{16n^4}}$ (02) $= \lim_{n\to\infty} \frac{3n^2}{4n^2} = \frac{3}{4} \neq 0$ (01)

Hence The Series is Divergent, By Divergence Test. (01) (01)

Exercise2: (03pts)

Let $\{S_n\}_{n\geq 0}$ be the sequence of partial sums of the series $\sum_{n=1}^{\infty} \frac{1}{n^2+3n+2}$.

a)- Find a formula for S_n.

$\frac{1}{n^2+3n+2} = \frac{1}{(n+1)(n+2)} = \frac{1}{n+1} - \frac{1}{n+2}$ (01)

$S_n = \left(\frac{1}{2}-\frac{1}{3}\right) + \left(\frac{1}{3}-\frac{1}{4}\right) + \cdots + \left(\frac{1}{n+1}-\frac{1}{n+2}\right)$

Thus $S_n = \frac{1}{2} - \frac{1}{n+2}$ (01)

b)- Use part (a) to find the sum of the series.

$S = \lim_{n\to\infty} S_n = \lim_{n\to\infty} \left(\frac{1}{2} - \frac{1}{n+2}\right) = \frac{1}{2}$ (01)

Therefore $\boxed{S = \frac{1}{2}}$.