Math 129 — Quiz 3 Print Name _____

Sec 019

Fall 2009

Do the following series converge or diverge?

$\sum_{n=1}^{\infty} \frac{3}{\sqrt{n-0.5}}$ behaves as $3/\sqrt{n}$ for large n, INTEGRAL TEST $\Rightarrow$ **diverges**

$\sum_{n=2}^{\infty} \frac{n^{10}}{n!}$ $\lim_{n\to\infty} \frac{(n+1)^{10}}{(n+1)!} \cdot \frac{n!}{n^{10}} = \lim_{n\to\infty} \frac{1}{n+1} = 0$, RATIO TEST $\Rightarrow$ **converges**

$\sum_{m=1}^{\infty} (-1)^m \sqrt{m}$ term of the series does not tend to 0 as $m \to \infty \Rightarrow$ **diverges**

$\sum_{k=2}^{\infty} \frac{1}{k(\ln k)^2}$ INTEGRAL TEST $\to \int_2^{\infty} \frac{dk}{k(\ln k)^2} = \frac{1}{\ln 2}$ — converges $\Rightarrow$ **converges**

$\sum_{p=-2}^{\infty} \frac{1}{p^3+2}$ first several terms do not affect the convergence, behaves as $1/p^3$ for large p, INTEGRAL TEST $\Rightarrow$ **converges**

$\sum_{n=0}^{\infty} \frac{(-1)^n}{(n^2+n+1)^{1/8}}$ $\lim_{n\to\infty} \frac{1}{(n^2+n+1)^{1/8}} = 0$, ALTERNATING SERIES TEST $\Rightarrow$ **converges**

$\sum_{n=1}^{\infty} \frac{2^{n/2}}{n^8}$ term of the series does not tend to 0 as $n \to \infty \Rightarrow$ **diverges**

$\sum_{m=1}^{\infty} \sin(m)$ term of the series does not tend to 0 as $m \to \infty \Rightarrow$ **diverges**