MATHEMATICS 201-203-RE
Integral Calculus
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Strategy for Testing Series

State the test used to determine the convergence of the following series and make a guess as to whether the series converges or diverges.

a) $\displaystyle\sum_{n=1}^{\infty}\frac{n-1}{n^2+n}$

b) $\displaystyle\sum_{n=1}^{\infty}\frac{3n-2\sqrt[3]{n}}{\sqrt[7]{n^2+5}}$

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

d) $\displaystyle\sum_{n=1}^{\infty}\frac{2^n}{n^2+1}$

e) $\displaystyle\sum_{n=1}^{\infty}\frac{\operatorname{arccot}(n)}{n^2+1}$

f) $\displaystyle\sum_{n=1}^{\infty}\left(\sqrt[n]{2}-1\right)^n$

g) $\displaystyle\sum_{n=1}^{\infty}\cos n$

h) $\displaystyle\sum_{n=2}^{\infty}\frac{\sin n}{n^5}$

i) $\displaystyle\sum_{n=1}^{\infty}\frac{2(-3)^{2n+3}}{4^{n-1}5^{1-3n}}$

j) $\displaystyle\sum_{n=1}^{\infty}\frac{2^n}{(2n+1)!}$

k) $\displaystyle\sum_{n=1}^{\infty}\frac{(-1)^n}{\sqrt{n}+1}$

l) $\displaystyle\sum_{n=1}^{\infty}\frac{4^n}{n+8^n}$

m) $\displaystyle\sum_{n=1}^{\infty}\frac{(-2)^{2n}}{n^n}$

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

o) $\sum_{n=2}^{\infty} \frac{\sqrt{n^3+1}}{\sqrt[4]{n^3-1}}$

p) $\sum_{n=2}^{\infty} \ln n$

q) $\sum_{n=0}^{\infty} \frac{n!}{2\cdot 5\cdot 8\cdot\cdots\cdot(3n+2)}$

r) $\sum_{n=1}^{\infty} \frac{e^{\frac{1}{n}}}{n^2}$

s) $\sum_{k=1}^{\infty} \frac{1}{\sqrt{k(k+2)}}$

t) $\sum_{n=1}^{\infty} \frac{(-1)^n n}{2^n (2n)!}$

u) $\sum_{n=1}^{\infty} \frac{\ln n}{n^2}$

v) $\sum_{n=0}^{\infty} \left(\frac{2n}{5+6n}\right)^n$

w) $\sum_{n=1}^{\infty} \frac{n+3}{3^n}$

x) $\sum_{n=1}^{\infty} \frac{n}{e^n}$

y) $\sum_{n=1}^{\infty} (-1)^n \frac{\sqrt{n}}{\sqrt{n}+1}$