Calculus with Analytic Geometry II

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1 Improper Integral Worksheet

I. Evaluate the following improper integrals

a. $\displaystyle\int_1^\infty \frac{dx}{1+x^2}$

b. $\displaystyle\int_0^{\pi/2} \tan(x)dx$

c. $\displaystyle\int_{-\infty}^\infty xe^{-x^2}dx$

II. Use the integral test to determine the convergence/divergence of the following series

a. $\displaystyle\sum_{k=1}^\infty \frac{k}{k^2+1}$

b. $\displaystyle\sum_{k=2}^\infty \frac{1}{k\ln(k)}$

c. $\displaystyle\sum_{k=1}^\infty \frac{k}{e^k}$