

Calculus with Analytic Geometry II

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1 Geometric/Telescoping Series Worksheet

For each of the following series, determine whether the series converges or diverges. If the series converges find its limiting value.

I. $\frac{1}{4} + \frac{2}{4} + \frac{2^2}{4} + \frac{2^3}{4} + \cdots$

II. $2 + \frac{2}{5} + \frac{2}{5^2} + \frac{2}{5^3} + \cdots$

III. $\frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \frac{1}{5 \cdot 6} + \cdots$

IV. $\sum_{k=1}^{\infty} \ln\left(\frac{k}{k+1}\right)$