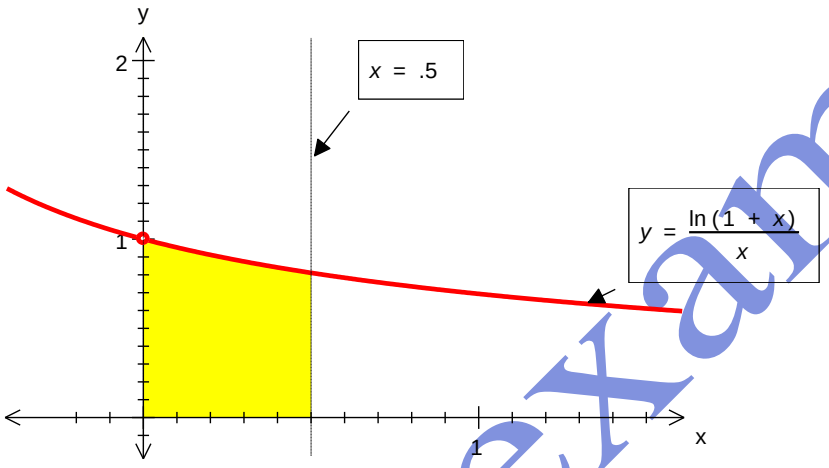
POWER SERIES ESTIMATION FOR A DEFINITE INTEGRAL

Objective: Write the power series for the integrand in a definite integral and then evaluate this integral.

1. Write the Maclaurin power series for the function $\frac{\ln(1+x)}{x}$
2. Use the first four terms of the series to evaluate the area bound by the function $\frac{\ln(1+x)}{x}$ and the lines $x = 0$, $x = 0.5$ and $y = 0$.



3. Use your GDC to find the actual area.
4. How close does the estimate come to the actual value?
5. Estimate the error involved in approximating the area in this way using the Alternating Series Estimation Theorem.
6. Would this approximation work as well for the integral $\int_0^2 \frac{\ln(1+x)}{x}\,dx$? Justify your answer.