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Calculus quiz 13 (§8.9)

1. Find a power series for the function $f(x) = \frac{1}{2-x}$, centered at $c = 0$, and determine the interval of convergence.

2. Find a power series for the function $f(x) = \frac{3x}{x^2+x-2}$ centered at $c = 0$, and determine the interval of convergence.

3. Use the power series $\frac{1}{x+1} = \sum_{n=0}^{\infty}(-1)^n x^n$ to determine a power series, centered at 0, for the function, $f(x) = \ln(x+1)$, and identify the interval of convergence.

4. Find the sum of the convergent series, $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{2^n}{5^n n}$. Explain how you obtained the sum.