Exam 2 is Tuesday, May 9

Power Series

$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{x^n}{n} = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \cdots$$

For a particular x, this is a numerical series

$x = \frac{1}{2}$ $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{\left(\frac{1}{2}\right)^n}{n} = \sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{n 2^n}$

converges

$x = 2 \quad \sum_{n=1}^{\infty} (-1)^{n+1} \frac{2^n}{n}$ diverges by nth term

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