

# Homework 4

March 24, 2025

1. Consider the function given by :

$$f(x) = \frac{1}{1-x}$$

Find the interval of convergence for each of the following.

**a.**  $f'(x)$     **b.**  $f''(x)$

2. Find a power series for  $f(x) = \frac{1}{6-x}$ , centered at  $x = 1$ .
3. Find a power series for  $f(x) = e^x \sin x$  centered at  $x = 0$  (up to the first four nonzero terms).