

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 1.9

Math 2000 Worksheet

WINTER 2020

For practice only. Not to be submitted.

1. Given $f(x) = \sum_{i=0}^{\infty} \frac{(-1)^i}{i+1} (x-2)^i$, find the interval of convergence of (a) $f(x)$, (b) $f'(x)$, and (c) $\int f(x) dx$.

2. Use the power series $\frac{1}{1-x} = \sum_{i=0}^{\infty} x^i$, $|x| < 1$, to find a power series, centered at $x = 0$, for each of the following functions. Identify the interval of convergence.

(a) $f(x) = \frac{8}{4x+7}$

(b) $f(x) = \frac{2}{(1-x)^3}$

(c) $f(x) = \ln(5x+1)$

(d) $f(x) = \frac{-4x^3}{(1+x^4)^2}$