Quiz #12, 4/20
Math 157 (Calculus II), Spring 2023

Problem 1 is worth 5 points (2.5 pts each part), and Problem 2 is worth 5 points (2.5 pts each part), for a total of 10 points. Remember to *show your work* on all problems!

1. Consider the rational function $f(x) = \dfrac{1}{1+2x}$.

   (a) Express this function as a power series centered at zero: $f(x) = \displaystyle\sum_{n=0}^{\infty} c_n x^n$.

   (b) Determine the radius of convergence R of the power series you found in part (a).

2. Consider the function $f(x) = e^{-x^2}$.

   (a) Recall that $e^x = \sum_{n=0}^{\infty} \frac{1}{n!} x^n$. Use this to express $f(x)$ as a power series centered at zero.

   (b) Write the first three nonzero terms of the derivative $f'(x)$, expressed as a power series centered at zero.