

Quiz #11, 4/18
Math 157 (Calculus II), Spring 2024

Problem 1 is worth 4 points, and Problem 2 is worth 6 points, for a total of 10 points. Remember to *show your work* on all problems!

1. For each of the following series, decide if it converges or diverges. Explain your answer.

(a) $\sum_{n=1}^{\infty} (-1)^{n-1} \cdot \frac{1}{\sqrt{n}}$ (**Hint:** it's an alternating series.)

(b) $\sum_{n=1}^{\infty} (-1)^{n-1} \cdot \frac{2n^2 - 1}{3n^2 + n + 2}$ (**Hint:** it's an alternating series, but look at limit of terms.)

(c) $\sum_{n=1}^{\infty} \frac{3^n - 1}{2^n + 1}$ (**Hint:** use the ratio test, or look at limit of the terms.)

(d) $\sum_{n=1}^{\infty} \frac{n^5}{2^n}$ (**Hint:** use the ratio test.)

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

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

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