# Quiz #11, 11/19
# Math 157 (Calculus II), Fall 2025

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

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

   (c) $\displaystyle\sum_{n=1}^{\infty}\frac{3^n-5}{2^n+5}$ (**Hint:** use the ratio test, or look at limit of the terms.)

   (d) $\displaystyle\sum_{n=1}^{\infty}\frac{4n^2}{3^n}$ (**Hint:** use the ratio test.)

2. Consider the rational function $f(x)=\dfrac{1}{1+3x}$.

   (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).