

PROBLEM SET #6

Due Friday, March 22, 2024 @ 12:30 pm

Submit as single pdf file to Canvas

Remember to review the [Guidelines for WeBWorK and Problem Sets](#) on the course webpage when writing up your solutions. The rule of thumb is that you should give enough explanation so that you could hand your assignment to a student who took Calc II last semester and they could follow your solutions.

1. Consider the series $\sum_{k=0}^{\infty} \frac{(-1)^k}{2k+1}$

(a) Show that the series converges.

(b) Use WolframAlpha to compute S_{50} .

How close is your partial sum to the exact value of the series? Why?

2. Consider the power series $P(x) = \sum_{k=0}^{\infty} (4x)^k$

What is the domain of $P(x)$? That is, for which values of x does $P(x)$ converge?

3. Consider the power series $P(x) = \sum_{k=0}^{\infty} \left(\frac{x-5}{2}\right)^k$

What is the domain of $P(x)$? That is, for which values of x does $P(x)$ converge?

4. Use the Maclaurin series for $\sin(x)$ and a four-function calculator (+, -, ×, ÷) to approximate $\sin(1)$ accurate with 0.001 of its exact value.

Explain how you know your answer is within this level of accuracy.