Homework 1

Due by the end of Saturday, Feb 01, 2025

[Last revision Jan 28, 2:52 PM]

Please complete the following questions

- **Problem set 1**

  - Question 5

- Problem set 2
  - Question 2
  - Question 4

- Problem set 3
  - Question 1 for $f(x) = x^6$ only
  - Question 2 for $x \exp(x) \approx x + x^2$ only
  - Question 3
    - The filename of the plot you are asked to create should be called `ps3_q3_taylor_series_approx.pdf` .

- Problem set 4
  - Question 1
  - Question 2
  - Question 4
    - The filename of the plot you are asked to create should be called `ps_4_qu_4_fd_approx_errors.pdf` .

Preparing your submission

- Where code is required to answer a question, please put the code for each question in a

seperate Python (`.py`) file. The file should be named

```
ps_M_qu_N.py
```

where `M` and `N` should be the problem set number and question number respectively.

- If the question contains multiple parts and you wrote code for each part, you can include all parts in a single Python file. Within the Python file, please clearly label with python comments where that start of each part begins. For example

```
# Answer for Problem set 4, Question 4

# Part 1 (computing derivatives using different approx.)
... code goes here ...

# Part 2 (compute the true error)
... more code goes here ...
```

- I will be running your Python code. Please make sure that code you submit runs.

- Where possible, use `print()` to display the answer the question. For example with Problem set 2, Question 4.

- All files for homework 1 should be contained with a directory called `YOUR_NAME_homework_1` . Please zip this directory and submit only the zip file.