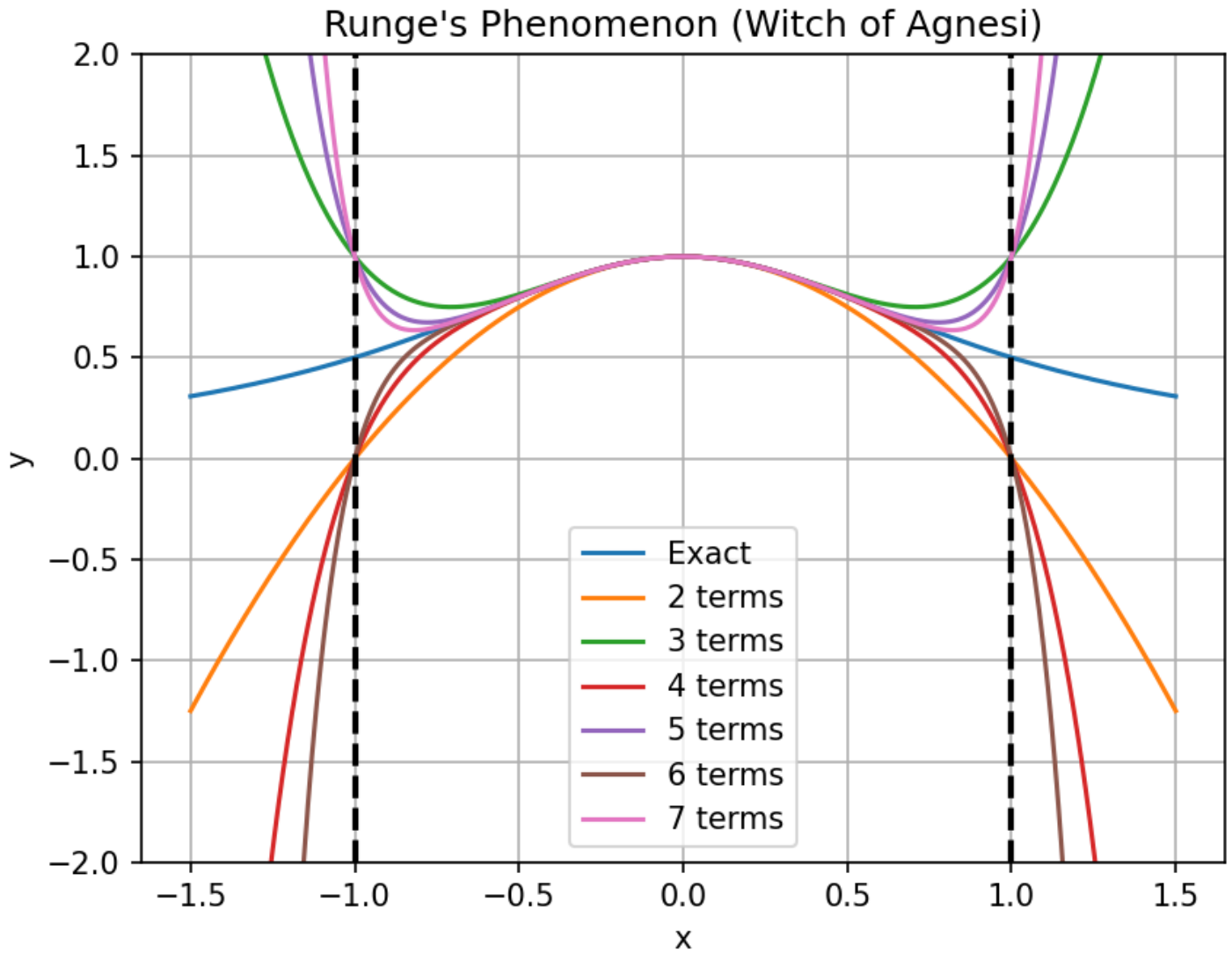
Task 12-01

- Create a Jupyter Lab notebook named **agnesi_witch.ipynb**
- Express Maria Agnesi's "witch" as a function using the simplified equation where
- Express as a power series over
- On a single graph, plot the exact value of and successively more (from 2 to 7) terms of its power series from
- The plots should visibly demonstrate that high-degree polynomial interpolation at equidistant points can be problematic because adding more terms does not always result in improved accuracy

Task 12-01 (cont.)



Task 12-01 (cont.)

- Typically, as we add more terms to a power series, our estimate becomes closer and closer to the exact value, however at the endpoints of the interval this power series behaves poorly
- Consider expanding the domain to include such as or , what happens at those points?
- Append a final cell in your notebook that contains (as comment lines) a short explanation (in prose) of:
  - Why Agnesi's Witch oscillates wildly (as we add more terms to the power series) as we approach or
  - How this simplified witch function demonstrates Runge's Phenomenon
- Upload your solution to the BNL QIS101 SharePoint site

Task 12-02

- Create a Python file named **werner_formula.py**
- Using pyplot, on one graph plot four functions over the domain
  1.
  2.
  3.
  4. Werner's Product-to-sum formula for
- Plot as a dotted line with open circle markers
- Use LaTeX encoding to populate the legend labels for each curve
- Upload your solution to the BNL QIS101 SharePoint site