

- Show your work.
 - This work must be submitted online as a **.pdf** through Canvas.
 - Work completed with LaTeX or Jupyter earns 1 extra point. Submit source file (e.g. **.tex** or **.ipynb**) along with the **.pdf** file.
 - If this work is completed with the aid of a numerical program (such as Python, Wolfram Alpha, or MATLAB) all scripts and data must be submitted in addition to the **.pdf**.
 - If you work with anyone else, document what you worked on together.
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1. (20 points) Give two reasons that make space-energy dependent dynamics necessary.
 2. (10 points) Give an example of a scenario in which energy dependent dynamics is necessary for reactor analysis.
 3. (10 points) Give an example of a scenario in which space dependent dynamics is necessary for reactor analysis.
 4. Describe and discuss the advantages and disadvantages of the following four approaches to space-energy dependent dynamics:
 - (a) (10 points) the finite difference solution approach
 - (b) (10 points) the nodal approach
 - (c) (10 points) the modal approach
 - (d) (10 points) the quasistatic approach
 5. Discuss the relation of the quasistatic and the adiabatic methods.
 - (a) (10 points) Which approximation is common to both?
 - (b) (10 points) What are the key differences?