

1. Bequette: Work through Module 3 sections 3.1 and 3.2. No problems required.
2. Write a Matlab program that, when given a number n as input, will print all the prime numbers between 0 and n . Do not use the `primes()` function!
3. What level of accuracy would you expect to be required for a model of a nanoassembly process? Why?
4. Why does a model need to be validated?
5. To create part of a climate model, researchers are interested in the dynamics of the melting sheets of ice. Consider carefully what you would want your model to capture. Assume that (1) the radiant energy adsorbed by the sheet of ice varies with time and is denoted as $Q(t)$ [$\text{J}/\text{m}^2\text{hr}$], (2) the heat of fusion of water is $300 \text{ kJ}/\text{kg}$ and the specific gravity of ice can be approximated as 1, (3) heat transfer from the sheet of ice to the underlying land and seawater is neglected for this simple model.
 - a. Identify the input, output, and state variable(s).
 - b. Write an energy balance for this system and create a dynamic model in deviation variables. State any other necessary assumptions.
6. Bequette: Chap. 2 #7