This list is intended as the start of a study guide. There is no guarantee that because a topic is listed here that it will be on the midterm, nor is there a guarantee that every problem on the midterm is represented in the list below. I've broken down the topics into three categories: problem solving, tasks, and basic computations. You can expect to find all of these categories represented on the midterm. The midterm will cover Chapter 2 sections 8 and 9 and Chapter 3 sections 1–8 and easier material from section 9.

Problem Solving and the Big Picture

- Solve word problems involving rates of change.
- Use the relationship between rates of change and slopes of tangent lines to interpret graphs.
- Solve basic related rates problems.
- Given a function describing a physical quantity (e.g. temperature as a function of time, or density as a function of temperature) be able to interpret the meaning of the derivative as a rate of change.
- Understand the relationship between positions, velocities and accelerations. Be able to solve word problems involving these quantities.

Tasks:

- Compute instantaneous rates of change.
- Compute slopes of tangents lines of functions.
- Determine the tangent line at a point on a graph or an implicitly defined curve.
- Use logarithmic differentiation to simplify the computation of a derivative.
- Find the derivative of an inverse function.

Computations:

- Be able to use the constant multiple, sum, product, power, and quotient rule.
- Be able to use the chain rule.
- Find an implicit first or second derivative.
- Know derivatives of exponential, trig, inverse trig, and logarithmic functions.