

Math 302 Vocabulary

Section 2.1

1. Define what we mean by an **equilibrium solution** for a system of differential equations.
2. Define what we mean by a **solution** to a system of differential equations.
3. Define what we mean by the terms **phase plane** and **phase portrait**.
4. How can we rewrite the **second-order** differential equation $\frac{d^2y}{dt^2} = -\frac{k}{m}y$ as a first-order system?

Section 2.2

1. Define **vector field** and **direction field**.
2. Define **equilibrium point** and **equilibrium solution**.
3. What does it mean to say that a system is **autonomous**? Are all systems autonomous?

Section 2.3

1. Define what it means to say that a system is **completely decoupled** and **partially decoupled**.
2. Convert the second-order differential equation $\frac{d^2y}{dt^2} + p\frac{dy}{dt} + qy = 0$ to a system of first-order differential equations.

Section 6.1

1. Define the **Laplace transform** of a function y .
2. What is the relationship between the Laplace transform of $\frac{dy}{dt}$ and the Laplace transform of y ?
3. Define **Linear operator** (p. 564).
4. Define **Inverse Laplace Transform**.

Appendix B

1. What is the Taylor series for $y(t) = e^t$ centered about $t = 0$ (a Maclaurin series)? (You can look this up, you don't need to derive it.)
2. What is the Taylor series for $y(t) = te^t$?