

Part I: NO CALCULATOR.

Good luck ☺

1. (1 point) You are a mad scientist, what scientific experiment would you run...?!

2. (8 points) True or False? Circle one. **No justifications necessary!**
 - (a) T or F: The function $y(t) = \sin(5t)$ is a solution to the differential equation $dy/dt = 5y$.

 - (b) T or F: Every autonomous differential equation is separable.

 - (c) T or F: Every separable differential equation is linear.

 - (d) T or F: It is possible for an autonomous equation $dy/dt = f(y)$ to only have two equilibrium points that are both node.

3. (8 points) Circle all that apply. (Note: "Homogeneous" only applies to linear equations.)
 - (a) $\frac{dy}{dt} - y = t$ Separable Autonomous Linear Homogenous Other

 - (b) $\frac{dy}{dt} = 2ty^2 + 3t^2y$ Separable Autonomous Linear Homogenous Other

 - (c) $\frac{dy}{dt} = \frac{ty^2 + t}{y}$ Separable Autonomous Linear Homogenous Other

 - (d) $\frac{dy}{dt} = y(y + 2)^2$ Separable Autonomous Linear Homogenous Other