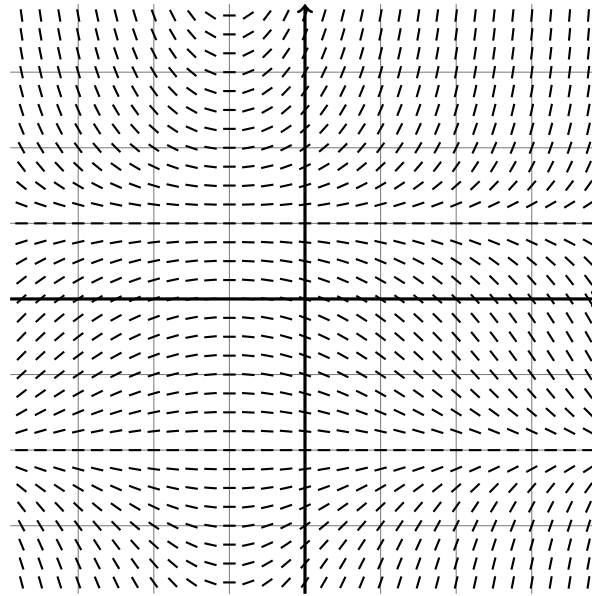


You must always justify your answers. This means: show your work, show it neatly, and when in doubt, use words (and pictures!) to explain your reasoning. No justification = no points.



1. (2 pts) The above direction field is a graph of one of the following differential equations. Determine which it is, and explain your reasoning.

$$\frac{dy}{dx} = (y^2 - 1) \sin x$$

$$\frac{dy}{dx} = \frac{1}{6}(x + 1)(y - 1)(y + 2)$$

$$\frac{dy}{dx} = \frac{2x}{3y}$$

2. (3 pts) What are the constant/equilibrium solutions to the differential equation graphed in the above direction field? Determine whether the equilibrium solutions are stable or unstable as $x \rightarrow +\infty$.

3. (5 pts) Find an equation for the solution to the differential equation graphed on the previous page that passes through the point $(1, -1)$. Sketch this solution on the previous graph. You do not need to simplify your answer.