Each of the questions below refer to the following differential equation. Be sure to show \( NEATLY \) your work.

\[
\frac{dy}{dt} = \alpha y^2 + 2y + \alpha
\]

1. (6) Sketch the bifurcation diagram for this differential equation. Be sure to indicate on your sketch the location of all bifurcation values and the character of the equilibrium points. That is, are they sources, sinks or nodes.

2. (4) Sketch the phase lines for appropriate values of \( \alpha \). These values should be picked in order to demonstrate all possible behaviors of solutions to this parametrized differential equation.