1. [10 points]

    a. [4 points] Consider the differential equation $y' = y^2 + y - 2$. Find all of the equilibrium solutions of the differential equation and indicate whether they are stable or unstable. Circle your answers.

    b. [4 points] Solve the differential equation $y' = y^2$ with initial condition $y(0) = 1$.

    c. [2 points] Which of the following functions is a solution to the differential equation $y' = \sin(x) + y$? Circle your answer.

$$y = \tfrac{1}{2}(\sin(x) + \cos(x))$$

$$y = -\tfrac{1}{2}(\sin(x) - \cos(x))$$

$$y = \tfrac{1}{2}(\sin(x) - \cos(x))$$

$$y = -\tfrac{1}{2}(\sin(x) + \cos(x))$$