(1) The family of functions \( y = \frac{Ce^x}{1 + Ce^x} \) solves the separable equation \( \frac{dy}{dx} = y(1 - y) \).

(a) Show that the IVP \( \frac{dy}{dx} = y(1 - y), \ y(0) = 0 \) has a solution that is a member of this family.

(b) Show that the IVP \( \frac{dy}{dx} = y(1 - y), \ y(0) = 1 \) DOES NOT have a solution that is a member of this family.

(c) Can you guess at a solution to the IVP \( \frac{dy}{dx} = y(1 - y), \ y(0) = 1 \)? (There is one that has a simple form.)

(2) Solve \( y' = y(1 - y) \) by separation of variables. **Hint:** \( \frac{1}{y(1-y)} \) has a partial fraction decomp \( \frac{1}{y} + \frac{1}{1-y} \).