Given the differential equation

\[ y' = -2y + 4 \quad \text{or} \quad \frac{dy}{dt} = -2y + 4. \]

(a) (1 point) Indicate if the equation is linear or nonlinear.

\[ \text{Linear} \]

(b) (2 points) Find the equilibrium solution or state that there is no equilibrium solution.

\[ -2y + 4 = 0 \]

\[ y = 2 \]

(c) (5 points) Find the general solution. Make sure to show all work!

\[ y' = -2(y - 2) \]

\[ \frac{y'}{y - 2} = -2 \]

\[ \left( \ln |y - 2| \right)' = -2 \]

\[ \ln |y - 2| = -2t + c \]

\[ |y - 2| = e^{-2t + c} \]

\[ y = 2 e^{-2t} + c \]

(d) (2 points) Find the solution with the initial conditions \( y(0) = 1 \) and indicate the behavior of the solution as \( t \to \infty \) (fill in the blank).

\[ y(0) = 1 \]

\[ 1 = 2 + c e^{-2(c)} \]

\[ c = -1 \]

\[ y = 2 - e^{-2t} \]

\( y \to 2 \) as \( t \to \infty \)