Chapter 1.1 & 1.2

Linear Algebra with applications to differential equations

College of the Atlantic. Winter 2019

1. Introduce yourself to others in your group.

2. Consider the differential equation
$$y' = y^2 \, . \tag{1}$$
   (a) Show that $y(x) = x^3/3$ is not a solution to Eq. (1).
   (b) Show that
$$y(x) = \frac{1}{C - x} \, , \tag{2}$$
   where C is a constant, is a solution to Eq. (1).
   (c) Suppose we know that $y(0) = 2$. Use this information to solve for C.

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3. Solve the IVP: $y' = x^2 + 4$, $y(1) = 2$.

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4. Construct the slope field for $y' = x - y$. First make a table of slope values, and then make the slope field plot.