# Chapter 1.4

**Linear Algebra** with applications to differential equations

**College of the Atlantic. Winter 2019**

1. (Re)introduce yourself to others in your group. Briefly share with your group-mates something about yourself that might be surprising.

2. Solve the IVP: $y' = -6xy$, $y(0) = 7$.

3. Solve the differential equation:
$$\frac{dy}{dx} = \frac{4 - x^2}{4y^3 + y - 5}\,. \tag{1}$$
. . . . . .

4. You find some old unicorn bones and determine that the old bones have about 80% as much $C^{14}$ as you would find in the bones of a living unicorn. How old are the old unicorn bones?
. . . . . .

5. Use separation of variables to solve the logistic differential equation:
$$\frac{dP}{dt} = rP(1 - \frac{P}{A}) \tag{2}$$
You will likely encounter an integral that you don't feel like doing by hand.