

Chapter 1.5

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 a book or article you've read recently that you found interesting or memorable.

2. Evaluate $\frac{d}{dx}(x^3 \sin(x))$.

3. Evaluate $\frac{d}{dx}(x^3 y)$, where y is a function of x .

4. Evaluate $\frac{d}{dx}e^{\sin(x)}$.

5. Evaluate $\frac{d}{dx}e^{G(x)}$.

.....¹

6. Consider the differential equation:

$$\frac{dy}{dt} + 2xy = x \tag{1}$$

(a) Find the general solution to this equation.

(b) Find the particular solution that has $y(0) = 2$.

7. Consider the differential equation:

$$\frac{dy}{dt} - \frac{y}{x} = -xe^{-x} . \tag{2}$$

(a) Find the general solution to this equation.

(b) Find the particular solution that has $y(0) = 2$.

(c) Huh?

¹Remember that dots mean you should stop.