Chapter 7.3

Linear Algebra with applications to differential equations

College of the Atlantic. Winter 2019

1. (Re)introduce yourself to your partners. I dunno. Make small talk for a moment.

2. Find the general solution to the following linear system:

$$x_1' = 4x_1 + 2x_2 \,, \tag{1}$$

$$x_2' = 3x_1 - x_2 \,. \tag{2}$$

   Determine the solution for which $\vec{x} = (2, 3)$.

. . . . . .

3. Consider the differential equation

$$y'' - 4y' + 5y = 0 \,. \tag{3}$$

   (a) Find two solutions to the differential equation.

   (b) Umm.

   (c) Write down two, real, linearly independent solutions to the differential equation. Choose one of these solutions and verify that it really is a solution.

   (d) Calculate the Wronskian of the two solutions you found.

   (e) Find the solution to the differential equation that has $y(0) = 2$ and $y'(0) = 4$.

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4. Find a real general solution to the system:

$$x_1' = 4x_1 - 3x_2 \,, \tag{4}$$

$$x_2' = 3x_1 + 4x_2 \,. \tag{5}$$