Section 3.1 : Systems of Two Linear Algebraic Equations

Chapter 3 : Systems of Two First Order Equations

Math 2552 Differential Equations
Section 3.1

Topics
We will cover these topics in this section.

1. Solving first order separable differential equations.

Objectives
For the topics covered in this section, students are expected to be able to do the following.

1. Determine the eigenvalues and eigenvectors of a matrix
2. Solve a system of two linear equations
3. Characterize a linear system in terms of the number of solutions, and whether the system is consistent or inconsistent.
4. Characterize a linear system in terms of its eigenvalues.
Examples

1. Solve the linear system, and determine whether the lines intersect, are parallel, or are coincident.

\[ x_1 - 2x_2 = -1 \]
\[ -x_1 + 3x_2 = 3 \]

2. Determine the eigenvalues and eigenvectors of the matrices.

a) \[ A = \begin{pmatrix} 5 & 2 \\ 2 & 1 \end{pmatrix} \]

b) \[ B = \begin{pmatrix} -5 & -5 \\ 5 & -5 \end{pmatrix} \]