Math 307

Chapter 6

Section 6.4: Nonhomogeneous Linear Systems

Contents

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What's The Trick?

Consider a nonhomogeneous system of ODEs

$$Y' = AY + G.$$

The trick is to use a method called **variation of parameter**.

Let M be the fundamental matrix of $Y' = AY$. We suppose we have the matrix M at hand.

Goal: Determine a vector function V such that $Y_P = MV$ is a particular solution to $Y' = AY + G$.

Example 1. Find the general solution to the system of ODEs

$$Y' = \begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix} Y + \begin{bmatrix} 2 \\ x \end{bmatrix}.$$