

## LECTURE SUMMARY 11.2

FRIDAY, JULY 22, 2016

### MATRICES METHOD FOR SOLVING SYSTEMS OF LINEAR HOMOGENEOUS DIFFERENTIAL EQUATIONS

1. How to transfer a system of linear homogeneous differential equations to a matrix form.
2. Theorem: Suppose that  $\lambda_1, \lambda_2, \dots, \lambda_n$  are distinct real eigenvalues of the  $n \times n$  matrix  $A$  with associated eigenvectors  $v_1, v_2, \dots, v_n$ , respectively. Then the general solution of  $z' = Az$  is given by

$$z = C_1 e^{\lambda_1 t} v_1 + C_2 e^{\lambda_2 t} v_2 + \dots + C_n e^{\lambda_n t} v_n$$

3. Examples.

Suggestion: Do exercises as many as possible.