Math 220, Week 5 Thursday, Section 4.2, 4.3

Spring 2020, XT

4.2 Homogeneous Linear Equations

1. Find a general solution to the differential equations

   (a) $2y'' + 7y' - 4y = 0$

   (b) $4y'' - 4y' + y = 0$

2. Solve the initial value problem

   (a) $y'' - 4y' + 3y = 0; \quad y(0) = 1, \quad y'(0) = 1/3$

   (b) $y'' - 4y' + 4y = 0 \quad y(1) = 1, \quad y'(1) = 1$

3. Determine whether the functions y_1 and y_2 are linearly dependent on $(0, 1)$

   (a) $y_1(t) = \cos t \sin t, \quad y_2(t) = \sin 2t$

   (b) $y_1(t) = 0, \quad y_2(t) = e^t$

4.3 Auxiliary Equations with Complex Roots

1. Find a general solution to the differential equations

   (a) $y'' + 2y' + 5y = 0$

   (b) $y'' - 3y' - 11y = 0$

2. Solve the initial value problem

   (a) $y'' + 9y = 0; \quad y(0) = 1, \quad y'(0) = 1$

   (b) $y'' - 2y' + 2y = 0 \quad y(\pi) = e^{\pi}, \quad y'(\pi) = 0$