Last Name:_____ First Name:_____

MAT 244S, GHA # 3. Mar. 10–Apr. 7, 98
Front page

Read Me First! (general rules for GHA)

- Don't write your student ID on this page!
- Take care to staple your homework! (no clips, please)
- Be nice, write neatly, use pen, please!
- This GHA constitutes 5% of the final mark (1 pt = 1%)
- You must deliver it to me until 21.30 pm Apr 7 in my office or earlier (on the lecture)
- Don't leave in mailboxes!

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1) *1.25 pt* (a) Find the general solution to the system ($\diamondsuit$):

$$(\diamondsuit)\begin{cases} y_1' - 2y_1 - y_2 = \cosh t + \cos t, \\ y_2' - y_1 - 2y_2 = \sinh t + \sin t. \end{cases} \qquad (\heartsuit)\begin{cases} y_1' - 2y_1 - y_2 = \dfrac{e^{2t}}{\cosh t}, \\ y_2' - y_1 - 2y_2 = 0. \end{cases}$$

For the corresponding homogeneous system find (**b**) solution, satisfying initial data $y_1(0) = 1, y_2(0) = 0$, (**c**) the fundamental system of solutions (**d**) the Wronskian of these solutions. (**e**) Find the equation for Wronskian without using solutions to the system, solve this equation and compare with (d).
(**f**) Find the general solution to the system ($\heartsuit$).

2) *1.25 pt* (a) Find the general solution to the system ($\diamondsuit$):

$$(\diamondsuit)\begin{cases} y_1' - 2y_1 - y_2 = \cosh t + \cos t, \\ y_2' + y_1 - 2y_2 = \sinh t + \sin t. \end{cases} \qquad (\heartsuit)\begin{cases} y_1' - 2y_1 - y_2 = \dfrac{e^{2t}}{\cos^3 t}, \\ y_2' + y_1 - 2y_2 = 0. \end{cases}$$

For the corresponding homogeneous system find (**b**) solution, satisfying initial data $y_1(0) = 1, y_2(0) = 1$, (**c**) the fundamental system of solutions (**d**) the Wronskian of these solutions. (**e**) Find the equation for Wronskian without using solutions to the system, solve this equation and compare with (d).
(**f**) Find the general solution to the system ($\heartsuit$).

3) *1.5 pt* (a) Find the general solution to the system ($\diamondsuit$):

$$(\diamondsuit)\begin{cases} y_1' - y_1 + 2y_2 - 5y_3 = \cosh t + \cos t, \\ y_2' + 2y_1 + 2y_2 - 2y_3 = \sinh t + \sin t, \\ y_3' - 5y_1 - 2y_2 - y_3 = 0 \end{cases} \qquad (\heartsuit)\begin{cases} y_1' - y_1 + 2y_2 - 5y_3 = \dfrac{1}{\cosh 3t}, \\ y_2' + 2y_1 + 2y_2 - 2y_3 = 0, \\ y_3' - 5y_1 - 2y_2 - y_3 = 0 \end{cases}$$

For the corresponding homogeneous system find (**b**) solution, satisfying initial data $y_1(0) = 1, y_2(0) = y_3(0) = 0$, (**c**) the fundamental system of solutions (**d**) the Wronskian of these solutions.
(**e**) Find the equation for Wronskian without using solutions to the system, solve this equation and compare with (d).

4) On the second page

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FOR MARKER'S USE ONLY	
Question	Mark
1	/1.25
2	/1.25
3	/1.50
4	/1.50
TOTAL	/5.0

That's right, you can get 6 points out of 5!

4) *1.5 pt*(a) Find the general solution to the system ($\diamondsuit$):

$$(\diamondsuit)\begin{cases} y_1' - 5y_1 - 2y_2 - y_3 = \cosh 6t + \cos t, \\ y_2' - 2y_1 - 2y_2 + 2y_3 = \sinh t + \sin t, \\ y_3' - \ y_1 + 2y_2 - 5y_3 = 0 \end{cases} \qquad (\heartsuit)\begin{cases} y_1' - 5y_1 - 2y_2 - y_3 = \dfrac{e^{3t}}{\cosh t}, \\ y_2' - 2y_1 - 2y_2 + 2y_3 = 0, \\ y_3' - \ y_1 + 2y_2 - 5y_3 = 0 \end{cases}$$

For the corresponding homogeneous system find (**b**) solution, satisfying initial data $y_1(0) = 1, y_2(0) = y_3(0) = 0$, (**c**) the fundamental system of solutions (**d**) the Wronskian of these solutions.
(**e**) Find the equation for Wronskian without using solutions to the system, solve this equation and compare with (d).
(**f**) Find the general solution to the system ($\heartsuit$).