NAME(S): _____ TA (circle one): Elizabeth Christian

_____ SECTION (circle one): 8AM 12PM 4PM 5PM 6PM 7PM

Project #2: 2nd Order Linear DEs
Solutions Page

Feedback

quality of mathematical ideas (7 pts)	
clarity of communication (3 pts)	

Please write your group or individual solution on this page. Staple any additional work for your solutions on the back of this page to turn in during section on Wednesday, October 29th. If you cannot attend section, get your solutions to your TAs mailbox in SH 6623 by 4:00pm that day.

Problem 1 [1] Consider the DE

$$y'' + 4y = 0.$$

(a) Find a *fundamental set* of solutions to the DE. That is, find two linearly independent solutions to the DE, call them y_1 and y_2.

(b) *Show* that any linear combination of your two solutions y_1 and y_2 from part (a) will also be a solution to the DE.

[1] This problem will be graded according to the DP Evaluation Rubric handout, available on GauchoSpace.

(c) Explain how to find a solution (from your linear combination solutions in part (b)) that satisfies the general initial conditions $y(0) = a$ and $y'(0) = b$.

(d) The DE $y'' + 4y = 0$ with initial conditions $y(0) = a$ and $y'(0) = b$ is an IVP. Does this IVP *always* have a solution? Will there ever be more than one solution to the IVP that can be written as a linear combination of your functions y_1 and y_2? Justify your claim by referring to your work for parts (b) and (c) above.