Math 45, Fall 2020
October 21, Quiz 07 Name: _____

Please show and explain your work where necessary. Good luck!!

1. (*8 points*) Let $f_1(x) = e^x$ and $f_2(x) = e^{x+2}$. Note that both functions are solutions to $y' = y$.

a. (*4 pts*) Compute the *Wronskian* $\mathcal{W}(f_1, f_2)$.

b. (*2 pts*) Are $f_1(x) = e^x$ and $f_2(x) = e^{x+2}$ linearly independent? Explain.

c. (*2 pts*) Do $f_1(x) = e^x$ and $f_2(x) = e^{x+2}$ form a fundamental set of solutions for $y' = y$? Explain.

2. (*2 points*) It is true that $y_1 = \sin(x)$ and $y_2 = \sin(x)$ form a fundamental set of solutions to the differential equation $y'' + y = 0$. Meanwhile we have $y_p = e^x$ is a solution to the differential equation $y'' + y = 2e^x$. (You do not need to show either of these previous two statements.) Provide the *general* solution to the differential equation $y'' + y = 2e^x$.