Math 4B Summer 2020
Quiz #5

No calculators

PRINT NAME

PERM NUMBER

TA: ☐ Trevor ☐ Nick

Time: ☐ 4:30 ☐ 5:30 ☐ 6:30 ☐ 7:30

1.

(a) Consider the system of equations

$$\mathbf{x}' = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix} \mathbf{x}.$$

Two solutions to this system are $\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} e^{2t}$ and $\begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix} e^{-t}$, and they are a linearly independent set[†]. However, without doing any computations, it can be seen that they are *not* a fundamental set. Why not? [How do you know?]

(b) What do we mean when we say that a fundamental solution set *spans* the set of all solutions?

[†]If you had to, how would you check this? [This isn't part of the question, but good to think about]

2. Write 3 true/false or short answer questions that you would put on the final exam if you were teaching this class. Give a key, explain the answers, then explain why you chose these particular questions and what you hope they will assess. **Each member should be writing 3 different questions from the rest of your group.**

You will only receive credit for this problem if your questions illustrate a variety of ideas from this course, show creativity and thoughtfulness, and are conceptual questions (no "solve this DE" or other purely computational questions).

(a) Question:

Answer and explanation:

In your role as "the teacher", why do you think this is a good exam question? What does this assess?

(b) Question:

Answer and explanation:

In your role as "the teacher", why do you think this is a good exam question? What does this assess?

(c) Question:

Answer and explanation:

In your role as "the teacher", why do you think this is a good exam question? What does this assess?