



Problem:

Investigate linear dependence for the following system of functions:  $e^x, e^{x+1}$ .

Solution:

$$y_1 = e^x, y_2 = e^{x+1}.$$

Using the definition of linear dependence  $\alpha_1 y_1 + \alpha_2 y_2 = 0, e^x(\alpha_1 + \alpha_2 e) = 0, \Rightarrow \alpha_1 + \alpha_2 e = 0 \Rightarrow$

$\Rightarrow \alpha_1 = -\alpha_2 e, \alpha_2 = 1 \Rightarrow \alpha_1 = -e \Rightarrow -e \cdot y_1 + 1 \cdot y_2 = 0 \Rightarrow$  the functions are linearly dependent.

Answer: linearly dependent.