

a) Find a particular solution of the system

$$y' = \begin{pmatrix} -3 & 2 \\ 2 & 2 \end{pmatrix} y + \begin{pmatrix} 3 e^t \\ 2 e^{-t} \end{pmatrix}$$

Using variation of parameters.

b) Find the solution of the associated homogeneous equation

$$Y_H' = \begin{pmatrix} -3 & 2 \\ 2 & 2 \end{pmatrix} Y_H$$

and use it to describe the set of all solutions of the problem in a)

c) Find the solution of the equation in a) solving the initial

condition  $y(0) = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$ .