

1. [5pts] Find the general solution of $X' = \begin{pmatrix} 5 & 1 \\ -2 & 3 \end{pmatrix} X$

2. [5pts] Determine whether the following solutions of a system $X' = AX$ form a fundamental set on $(-\infty, \infty)$:

$$X_1 = \begin{pmatrix} 1 \\ 6 \\ -13 \end{pmatrix}, X_2 = \begin{pmatrix} 1 \\ -2 \\ -1 \end{pmatrix} e^{-4t}, X_3 = \begin{pmatrix} 2 \\ 3 \\ -2 \end{pmatrix} e^{3t}$$