HOMEWORK 4
Due Oct 2

1. Exercise 7, page 43
2. Exercise 8, page 45
3. Express e^{tA} in terms of A for

$$A = \begin{bmatrix} -1 & -1 & -4 \\ -1 & -1 & -4 \\ -4 & -4 & 2 \end{bmatrix}$$

4. Sketch all the possible phase portaits of the system

$$x' = ax - 2y, \quad y' = 3x - y$$

   as the parameter varies from $-\infty < a < \infty$.

5. Sketch the phase portrait for the three-d system:

$$\begin{aligned} x' &= -x + 4y \\ y' &= -y - 4x \\ z' &= z \end{aligned}$$