

Worked Out Homework 3
MA 303 Fall 2011 (Aaron N. K. Yip)
Friday, Sept. 30, in class

1. For each of the following system, find the general solution and plot the phase plot:

(a) $\frac{dX}{dt} = \begin{pmatrix} 1 & 1 \\ 2 & 2 \end{pmatrix} X$

(b) $\frac{dX}{dt} = \begin{pmatrix} 1 & 1 \\ -2 & -2 \end{pmatrix} X$

(c) $\frac{dX}{dt} = \begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix} X$

(d) $\frac{dX}{dt} = \begin{pmatrix} -3 & 1 \\ -1 & -1 \end{pmatrix} X$

2. (Textbook) p. 519, Section 9.3, # 26 (a) and (c) (only).

(Hint: for (c), write down the differential equation for $r(t)$.)

3. (Textbook) p. 519, Section 9.3, # 27.

4. (Textbook) p. 519, Section 9.3, # 28.