

M146 Quiz 08 Thurs May 18, 2006 Name:

(1) Let $A = \begin{bmatrix} 1 & 1 \\ 4 & 1 \end{bmatrix}$, $x = \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix}$

(1a) Find the general solution to the system $x' = Ax$.

(1b) Find the solution for which $x_1(0) = 5$, $x_2(0) = 2$.

(2) Let P be the papallelogram in the plane with vertices $(0, 0)$, $(2, 1)$, $(3, 4)$ and $(1, 3)$. Calculate the area of P .

(3) Calculate $\det \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 5 \\ 2 & 6 & 11 \end{bmatrix}$

(4a) $A = \begin{bmatrix} 1 & -1 & 4 \\ 3 & 2 & -1 \\ 2 & 1 & -1 \end{bmatrix}$ The three eigenvalues are $\lambda_1 = 1$, $\lambda_2 = -2$, $\lambda_3 = 3$.

(4a) Find the general solution to the system $x' = Ax$, where $x = \begin{bmatrix} x_1(t) \\ x_2(t) \\ x_3(t) \end{bmatrix}$

(4b) Find the solution for which $x_1(0) = 9$, $x_2(0) = 3$, $x_3(0) = 1$.