HW MATH227/5 Solutions

1.

(a) $det(kA) = -40$; $det(A) = -10$, $2^2 det(A) = -40$.

(b) $det(kA) = -448$; $det(A) = 56$, $(-2)^3 det(A) = -448$.

2. $det(AB) = -170$; $det(A)det(B) = 10.(-17) = -170$

3.

(a) $k = 0.4384$, $k = 4.5616$.

(b) $k = -1$.

4. Express the following linear systems in the form $(\lambda I - A)x = 0$.

$$(a) \quad (\lambda I - \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix})x = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$(b) \quad (\lambda I - \begin{bmatrix} 2 & 3 \\ 4 & 3 \end{bmatrix})x = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$(c) \quad (\lambda I - \begin{bmatrix} 3 & 1 \\ -5 & -3 \end{bmatrix})x = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

5. (a) $M_{11} = 29$, $M_{12} = 21$, $M_{13} = 27$, $M_{21} = -11$, $M_{22} = 13$, $M_{23} = -5$, $M_{31} = -19$, $M_{32} = -19$, $M_{33} = 19$.

(b)$C_{11} = 29$, $C_{12} = -21$, $C_{13} = 27$, $C_{21} = 11$, $C_{22} = 13$, $C_{23} = 5$, $C_{31} = -19$, $C_{32} = 19$, $C_{33} = 19$.

6. $det(A) = -66$

7.

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0.2727 \\ 0.1818 \\ -0.0909 \end{bmatrix}$$

8. $det(A) = -1080$