MATH227 HW 4 SOLUTIONS

1.

$$\begin{vmatrix} 3 & 5 \\ -2 & 4 \end{vmatrix} = 22$$

2.

$$\begin{vmatrix} -2 & 7 & 6 \\ 5 & 1 & -2 \\ 3 & 8 & 4 \end{vmatrix} = 0$$

3.

$$(a) \quad (\lambda - 2)(\lambda + 4) + 5 = 0 \quad \Rightarrow \quad (\lambda - 1)(\lambda + 3) = 0 \quad \Rightarrow \begin{cases} \lambda_1 = 1 \\ \lambda_2 = -3 \end{cases}$$

$$(b) \quad (\lambda - 4)\big[\lambda(\lambda - 1) - 6\big] = 0 \quad \Rightarrow \quad (\lambda - 4)(\lambda - 3)(\lambda + 2) = 0 \quad \Rightarrow \begin{cases} \lambda_1 = 4 \\ \lambda_2 = 3 \\ \lambda_3 = -2 \end{cases}$$

4.

(a) -120

(b) -120

5.

$$(a) \quad \det(A) = \begin{vmatrix} -2 & 3 \\ 1 & 4 \end{vmatrix} = -11$$

$$\det(A^T) = \begin{vmatrix} -2 & 1 \\ 3 & 4 \end{vmatrix} = -11$$

$$(b) \quad \det(A) = -5$$

$$\det(A^T) = -5$$

6.

(a) -30

(b) -2

(c) 0

(d) 0

7.

$$\det(A) = \begin{vmatrix} 1 & 1 & 2 \\ 0 & 1 & 2 \\ 0 & 0 & 5 \end{vmatrix} = 5$$