Math 075 Homework 3

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Exercise 2.1.14

Problem

In each case determine all s and t such that the given matrix is symmetric

Part (c)

$$\begin{bmatrix} s & 2s & st \\ t & -1 & s \\ t & s^2 & s \end{bmatrix}$$

Solution (c)

$$\begin{cases} t = 2s \\ t = st \\ s^2 = s \end{cases}$$

$$\begin{cases} s = 1 \\ t = 2 \end{cases}$$

The given matrix is symmetric when $s = 1$ and $t = 2$.

Exercise 2.2.15

Problem

In each case find the matrix A.

Part (a)

$$\left(A + 3 \begin{bmatrix} 1 & -1 & 0 \\ 1 & 2 & 4 \end{bmatrix}^T = \begin{bmatrix} 2 & 1 \\ 0 & 5 \\ 3 & 8 \end{bmatrix} \right)$$

Solution (a)

$$A + 3 \begin{bmatrix} 1 & 1 \\ -1 & 2 \\ 0 & 4 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 0 & 5 \\ 3 & 8 \end{bmatrix}$$

$$A + \begin{bmatrix} 3 & 3 \\ -3 & 6 \\ 0 & 12 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 0 & 5 \\ 3 & 8 \end{bmatrix}$$

$$A = \begin{bmatrix} -1 & -2 \\ 3 & -1 \\ 3 & -4 \end{bmatrix}$$

Exercise 2.2.1