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In [1]: ### CSCI-3080 Discrete Structure
    ### OLA 3: Chapter 5 -- Matrices
    ### Name:
    ### Student ID:
    ### Date:
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Exercise 1: Find x and y if

$$\begin{pmatrix} 1 & 3 \\ x & x+y \end{pmatrix} = \begin{pmatrix} 1 & 3 \\ 2 & 6 \end{pmatrix}$$

$$x = 2$$

Exercise 2: Compute A + rD

y = 4

$$A + rD = \begin{pmatrix} 2 & 1 \\ -1 & 0 \\ 3 & 4 \end{pmatrix} + 3 \begin{pmatrix} 4 & -6 \\ 1 & 3 \\ 2 & -1 \end{pmatrix}$$

Exercise 3: Compute B.D

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$$\mathbf{B} \cdot \mathbf{D} = \begin{pmatrix} 4 & 1 & 2 \\ 6 & -1 & 5 \\ 1 & 3 & 2 \end{pmatrix} \cdot \begin{pmatrix} 4 & -6 \\ 1 & 3 \\ 2 & -1 \end{pmatrix}$$

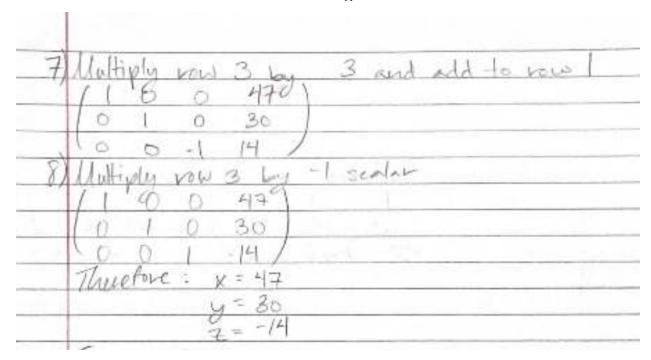
Exercise 4: Solve the system of equations using Gaussian Elimination (Please show all the steps)

$$-x + 2y + z = -1$$

$$3x - 5y - z = 5$$

$$2x - y + 3z = 22$$

1 2 1 -1	OH IS_SOON Suppler Polestock	
3 -5 -1 5 0 0 1 0 y 2 -1 3 22 0 0 0 1 2 Multiply vow 1 by 3 and add to row 3 -1 2 1 -1 0 1 2 2 0 0 0 1 2 2 Multiply row 1 by 2 and add to row 3 1 0 1 2 2 0 0 3 5 20 0 4 Multiply row 2 by 2 and add to row 1 1 8 3 5 0 0 0 1 2 2 0 0 3 5 20 0 5 Multiply row 2 by 2 and add to row 3 1 0 1 2 2 0 0 3 5 20 0 5 Multiply row 2 by 3 and add to row 3 1 0 3 5 0 0 1 2 2 0 0 0 -1 14 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	, 00	
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2 -1 3 22 / 2 / 1 -1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
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6 Multiply you 3 by 2 and add to you 2	The second secon	
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0 1 0 30		6
0 0 -1 /4/		
	0 0 -1 /4/	



In [19]:
$$x = 47$$

 $y = 30$
 $z = -14$

Exercise 5: For the given Boolean matrices, calculate A \wedge B, A \vee B, A \times B, and B \times A

(Don't need to show all steps, the final result is fine.)

$$\mathbf{A} = \begin{pmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$

 $A \wedge B$

$$\begin{pmatrix}
1 & 0 & 0 \\
0 & 1 & 1 \\
0 & 0 & 1
\end{pmatrix}$$

 $A \vee B$

$$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$

 $A \times B$

$$\begin{pmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$

$$\mathsf{B} \times \mathsf{A}$$

$$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$