

**Prelim Revision****Gaussian Elimination**

Solve the following systems of equations using Gaussian Elimination

1) 
$$\begin{aligned}x + 2y + 3z &= 7 \\2x + 3y + z &= 16 \\x + 5y - 2z &= 21\end{aligned}$$

2) 
$$\begin{aligned}x + 2y - 3z &= 0 \\2x + 3y + z &= -5 \\x + 2y - z &= -2\end{aligned}$$

3) 
$$\begin{aligned}x + 2z &= 11 \\2x + y + 2z &= 15 \\x + 2y - z &= 1\end{aligned}$$

4) 
$$\begin{aligned}x + 2y - 2z &= 12 \\2x + 3y + z &= -4 \\3x + 8y - 5z &= 26\end{aligned}$$

5) 
$$\begin{aligned}x + y &= 3 \\x - y - z &= 7 \\3x + 5y + 2z &= -1\end{aligned}$$

6) 
$$\begin{aligned}x + 2y &= 3 \\x + z &= -2 \\2x + 2y - z &= 6\end{aligned}$$

7) 
$$\begin{aligned}x + 5y + 2z &= 15 \\2x + y - z &= -9 \\x + 3y + z &= 7\end{aligned}$$

8) 
$$\begin{aligned}x - 3y + 2z &= 5 \\2x + y - z &= 7 \\2x + 2y + 3z &= 16\end{aligned}$$

9) 
$$\begin{aligned}x + y - z &= -1 \\3x + y + z &= -19 \\x - 2y - 3z &= -1\end{aligned}$$

10) 
$$\begin{aligned}x + 2y + z &= 6 \\x + 6y - 2z &= 15 \\4x - 2y + 3z &= 10\end{aligned}$$

11) 
$$\begin{aligned}x + 2y + z &= 7 \\x + 4y - z &= 11 \\2x + y + 3z &= 6\end{aligned}$$

12) 
$$\begin{aligned}x + 2y - 3z &= 17 \\3x + 4y + z &= 53 \\2x - y + 2z &= 5\end{aligned}$$

13) 
$$\begin{aligned}2x - 3y + z &= -4 \\3x + 4y - 2z &= 25 \\5x + y + 3z &= 5\end{aligned}$$

14) 
$$\begin{aligned}2x + 2y + 3z &= 14 \\3x - y + 4z &= 8 \\5x + y + 2z &= 12\end{aligned}$$

15) 
$$\begin{aligned}2x + y + 3z &= 7 \\x + 2y + 4z &= 8 \\3x + 4y + 2z &= 38\end{aligned}$$

Answers.

1)  $x = 4, y = 3, z = -1$     2)  $x = 1, y = -2, z = -1$     3)  $x = 3, y = 1, z = 4$

4)  $x = 4, y = -2, z = -6$     5)  $x = 2, y = 1, z = -6$     6)  $x = \frac{1}{2}, y = 1\frac{1}{4}, z = -2\frac{1}{2}$

7)  $x = -2, y = 1, z = 6$     8)  $x = 4, y = 1, z = 2$     9)  $x = -6, y = 2, z = -3$

10)  $x = 4, y = 1\frac{1}{2}, z = -1$     11)  $x = 0, y = 3, z = 1$     12)  $x = 5, y = 9, z = 2$

13)  $x = 3, y = 2, z = -4$     14)  $x = 1, y = 3, z = 2$     15)  $x = 4, y = 8, z = -3$