1-6

September 14, 2025

”Find the solution by inverting the matrix and solving for the coeffcient as outlined in Theorem 1.6.2 (THEOREM 1.6.2 If A is an invertible $n \times n$ matrix then for each $n \times 1$ matrix b the system of equations $A\mathbf{x} = \mathbf{b}$ has exactly one solution namely $\mathbf{x} = A^{-1}\mathbf{b}$.)”

1

$$
\begin{aligned}
x_1 + x_2 &= 2 \\
5x_1 + 6x_2 &= 9
\end{aligned}
$$

3

$$
\begin{array}{rcl}
x_1 + 3x_2 + x_3 & = & 4 \\
2x_1 + 2x_2 + x_3 & = & -1 \\
2x_1 + 3x_2 + x_3 & = & 3
\end{array}
$$

Solve the system of equations by reducing the appropriate augmented matrix.

9

$x_1 - 5x_2 = b_1$
$3x_1 + 2x_2 = b_2$

(i) $b_1 = 1, \quad b_2 = 4$

(ii) $b_1 = -2, \quad b_2 = 5$

Determine conditions on the b_i's if any in order to guarantee that the linear system is consistent.

13

$x_1 + 3x_2 = b_1$
$-2x_1 + x_2 = b_2$

15

$$
\begin{aligned}
x_1 - 2x_2 + 5x_3 &= b_1 \\
4x_1 - 5x_2 + 8x_3 &= b_2 \\
-3x_1 + 3x_2 - 3x_3 &= b_3
\end{aligned}
$$