SECTION 2.5   **Math 2050 Worksheet**   WINTER 2026

For practice only. Not to be submitted.

1. Use Gaussian elimination to determine if each of the following matrices is invertible. If so, show its inverse.

(a) $A = \begin{bmatrix} 4 & -8 & 0 \\ 12 & -23 & 0 \\ 0 & 20 & 4 \end{bmatrix}$

(b) $B = \begin{bmatrix} 1 & 0 & 2 \\ 3 & 1 & 0 \\ 1 & -1 & 8 \end{bmatrix}$

(c) $C = \begin{bmatrix} 1 & 0 & 3 & -2 \\ -4 & 1 & -8 & 8 \\ 6 & 0 & 19 & -12 \\ 0 & -2 & -8 & 1 \end{bmatrix}$

2. (a) Solve the system
$$\left. \begin{aligned} x \quad\quad - \quad 3z &= 1 \\ 5x + \tfrac{1}{3}y - 15z &= 3 \\ -x + \quad y + \quad 4z &= -6 \end{aligned} \right\}$$
by writing it in the form $A\mathbf{x} = \mathbf{b}$ and computing $\mathbf{x} = A^{-1}\mathbf{b}$.

(b) Briefly explain why the method of part (a) would not work for the system
$$\left. \begin{aligned} x \quad\quad - \quad 3z + 4w &= 1 \\ 5x + \tfrac{1}{3}y - 15z - \quad w &= 3 \\ -x + \quad y + \quad 4z - 7w &= -6 \end{aligned} \right\}$$

3. Express $A = \begin{bmatrix} 4 & -6 \\ 1 & -1 \end{bmatrix}$ as a product of elementary matrices.