

1. Write down the **augmented matrix** corresponding to the system

$$\begin{array}{rcl} 4x - 4y - 4z & = & -1 \\ 4x - 2y - 2z & = & 1 \\ 2y - 4x + 5z & = & -4. \end{array} \quad \left(\begin{array}{ccc|c} 4 & -4 & -4 & -1 \\ 4 & -2 & -2 & 1 \\ -4 & 2 & 5 & -4 \end{array} \right)$$

2. True/False. No justification required.

If an augmented matrix has a pivot in the last column (the augmentation), then the corresponding system of equations is **inconsistent**.

(T) / F

3. (a) Reduce the following matrix to **echelon form**:

$$A = \begin{pmatrix} 3 & -6 & 0 \\ 9 & -17 & -1 \\ 0 & -2 & 1 \end{pmatrix} \xrightarrow{R_2 - 3R_1} \begin{pmatrix} 3 & -6 & 0 \\ 0 & 1 & -1 \\ 0 & -2 & 1 \end{pmatrix} \xrightarrow{R_3 + 2R_2} \begin{pmatrix} 3 & -6 & 0 \\ 0 & 1 & -1 \\ 0 & 0 & -1 \end{pmatrix}$$

- (b) Find the **reduced row echelon form** (rref) for the matrix from (a).

Since the 3×3 matrix A has 3 pivots, as we can see from the echelon form above, its

reduced echelon form must be $I_3 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$.