

## MATH 2270: QUIZ 1

1. (2 points) Find the reduced echelon form of the matrix

$$\begin{pmatrix} 1 & 4 & 0 & 7 \\ 2 & 7 & 0 & 10 \end{pmatrix}$$

2. (3 points) Let  $\mathbf{u} = \begin{pmatrix} 1 \\ -1 \\ -1 \end{pmatrix}$  and  $A = \begin{pmatrix} 3 & -5 \\ -2 & 6 \\ 1 & 1 \end{pmatrix}$ . Is  $\mathbf{u}$  in the span of the columns of  $A$ ? Show your work.

3. (1 point each) Short answer (no justification needed).

A) If  $A$  is a  $5 \times 3$  matrix then is the product  $A \cdot A$  defined?

B) If  $A$  is row equivalent to the matrix  $\begin{pmatrix} 1 & 3 & 2 & 7 \\ 0 & 7 & 3 & 6 \\ 0 & 0 & 3 & 3 \end{pmatrix}$ , then the equation  $A\mathbf{x} = \mathbf{0}$  has how many solutions? (zero, 1, or infinitely many?)

C) Let  $\mathbf{b} = \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$  with  $A$  as in problem B). Does the equation  $A\mathbf{x} = \mathbf{b}$  have at least one solution?

D) If  $\mathbf{v} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$  then  $\text{span}\{\mathbf{v}\}$  is a set containing infinitely many vectors in  $\mathbb{R}^3$ . (True/False)

E) The set  $\text{span}\left\{\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, \begin{pmatrix} 2 \\ 4 \\ 6 \end{pmatrix}\right\}$  is a line in  $\mathbb{R}^3$ . (True/False)