

Math 1553 Quiz: §1.1

Solutions

1. [3 points] Give an example of a system of two linear equations in two variables that has infinitely many solutions.

Solution.

There are many answers. One is

$$\begin{aligned}x + y &= 1 \\2x + 2y &= 2.\end{aligned}$$

2. [1 point each] For each matrix, decide if it is in row echelon form (REF), reduced row echelon form (RREF), or neither. Circle the correct answer.

$\begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$	none	$\begin{pmatrix} 1 & 3 & 0 & & 0 \\ 0 & 0 & 1 & & 0 \\ 0 & 0 & 0 & & 1 \end{pmatrix}$	none	$\begin{pmatrix} 1 & 3 & 0 & & 4 \\ 0 & 0 & 1 & & -1 \\ 0 & 0 & 0 & & 0 \end{pmatrix}$	none
	REF		REF		REF
	RREF		RREF		RREF
		$(1 \ 1 \ 1 \ 1)$	none	$\begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix}$	none
			REF		REF
			RREF		RREF

Solution.

The first matrix is in REF. The second, third, and fourth are in RREF. The last is not in echelon form.

3. [2 points] Give two different ways of making the top-left entry of the following matrix into 1 using a single row operation.

$$\begin{pmatrix} 3 & 0 & 2 \\ 1 & 14 & -7 \\ -2 & -2 & -3 \end{pmatrix}$$

Solution.

One possibility is to replace R_1 by $R_1 + R_3$. Another is to swap the first two rows.