
Name:

Section: 8:20AM 9:20AM

1. The augmented matrix

$$A = \left[\begin{array}{cccc|c} 2 & 1 & 1 & 0 & 5 \\ 1 & -2 & -1 & 1 & 7 \\ 1 & 1 & -1 & -2 & -2 \\ 4 & 0 & 1 & 1 & 14 \end{array} \right]$$

represents a system of linear equations in four variables and is equivalent to

$$B = \left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 3 \\ 0 & 1 & 0 & -1 & -3 \\ 0 & 0 & 1 & 1 & 2 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right].$$

a) B is in reduced echelon form.

True

False

b) The system represented by B has the same solution set as that by A .

True

False

c) Write down the general solution of the system represented by B (in other words, write each variable in terms of the free variables; indicate the variables which are free in your solution).

$$x_1 =$$

$$x_2 =$$

$$x_3 =$$

$$x_4 =$$

2. A system of four linear equations in four variables cannot have infinitely many solutions.

True

False

3. A system of two linear equations in four variables always has infinitely many solutions.

True

False

4. Write the following system in vector form.

$$2x_1 - 3x_2 + x_3 = 1$$

$$3x_1 + x_2 = -2$$

$$-x_1 + 2x_2 + 4x_3 = 5$$

5. Two distinct vectors in \mathbb{R}^3 always span a plane.

True

False

6. Four or more distinct vectors in \mathbb{R}^3 always span the entire \mathbb{R}^3 .

True

False

Score:

/10
