
Exercise 1 Consider an augmented matrix of the form

$$\left[A \mid \mathbf{b} \right]$$

corresponding to a system of linear equations.

True or False?

1. If there is more than one solution, $\left[A \mid \mathbf{b} \right]$ has a row of zeros.

Multiple Choice:

- (i) True
- (ii) False

2. If $\left[A \mid \mathbf{b} \right]$ has a row of zeros, there is more than one solution.

Multiple Choice:

- (i) True
- (ii) False

3. If there is no solution, $\text{rref}(A)$ has a row of zeros.

Multiple Choice:

- (i) True
- (ii) False

4. If $\text{rref}(A)$ has a row of zeros, there is no solution.

Multiple Choice:

- (i) True
- (ii) False

5. There is NO system that is inconsistent for every $\mathbf{b}$.

Multiple Choice:

- (i) True
- (ii) False

6. If the system is consistent for some choice of $\mathbf{b}$, it is consistent for every choice of $\mathbf{b}$.

Multiple Choice:

- (i) True
- (ii) False

Source

[Nicholson] W. Keith Nicholson, *Linear Algebra with Applications*, Lyryx 2021, Open Edition, Problem 1.2.12.