EXERCISES OF CHAPTER 2

Question 1. Suppose that A is an $m \times n$ matrix and $AX = b$ has infinitely many solutions. Which of the following statement must be true?

1. $m \leq n$

2. $n \leq m$

3. $\text{rank} A = n$

4. $\text{rank} A < n$

Question 2. Find all value(s) of a for which $AX = 0$ has non-trivial solution, where

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 2 & 1 & 1 \\ 1 & a & 2 \end{bmatrix}$$