

Answer on Question #80368 – Math – Abstract Algebra

Question

The characteristic of a field containing $(50 - 1)$ elements is 50. Is this statement TRUE or FALSE? Give a reason for your answer.

Solution

Let F be such a field. F is finite because it contains a finite number of elements, and therefore the characteristic of F is a prime, but 50 is not a prime.

On the other hand, the order of F is $50 - 1 = 49$. Since the order of any finite field is a power of its characteristic, the characteristic of F is 7, it is not equal to 50.

Answer:

False. The characteristic of such a field is not 50.