

Question: Proof - 1

Prove the following:

Suppose that there is a 52 card deck divided evenly into 4 suits. If three cards are drawn out of the deck, either exactly one suit has either more cards remaining than the other suits or exactly one suit has less cards remaining than the other suits, both scenarios do not occur at once.

Question: Proof - 2

Prove the following:

Given that $x, y \in \mathbb{Z}$, if xy is not a multiple of 7, then neither x nor y are multiples of 7.

\mathbb{Z} : Set of integers

Question: Proof - 3

Prove the following:

Given that n and m are even integers, there are no values of n and m which satisfy $n^2 - 4m = 3$.

Question: Proof - 4

Prove the following:

$|x + (1 / x)| \geq 2$ is true for $x \in \mathbb{R}$ where $x \neq 0$.

\mathbb{R} : Set of real numbers

Question: Proof - 5

Prove the following:

If n is composite, then it is divisible by a number in interval $(1, \sqrt{n}]$.

*A number in the given interval must be > 1 and $\leq \sqrt{n}$.