

Answer on Question #78422 – Math – Algebra

Question

$$x^m + a_1x^{m-1} + \dots + a_{m-1}x + a_m = 0, a_i \in R \forall i = 1, \dots, m.$$

This equation has a root in R only if m is an odd number. Is it true or false?

Solution

Let's consider an example

$$x^2 + 2x + 1 = 0, a_1 = 2, a_2 = 1, m = 2 \text{ (even)}$$

The equation above has -1 ($-1 \in R$) as a root. Because $m = 2$ is an even, the statement in the question is false.