

Simple Concept Tough Problem - 6

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"What delighted me most about mathematics was that things could be proved" - Bertrand Russell.

Yes, proofs are always a delight for mathematicians. In fact, they are not satisfied with just one way of arriving at something. Finding several approaches to the same thing delights a mathematician even more. The problems that we discuss here may also have several ways of solution. I request the readers to provide their own methods in the comments or in mail. Let's share our knowledge !

Today, we shall take up the following problem :

Find all positive integer solutions (a,b,c,n) of positive integers of the equation $a!+b!+c!=2^n$.

We just require the idea of factorials and a few properties of divisibility in order to solve this problem. Here is an explanation of the detailed solution :

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