Math Diversion Problem 422

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> The problem is that if you don't have any ideas
> [how to solve the problem], you are forced to
> just do grunt work ... in a matrix [a table].
> — Simon Pampena
> (from: *The Return of the Legend of Question Six* – Numberphile)

The YouTube video is found at:

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Source: https://www.youtube.com/watch?v=64TBOpB2-7k
Title: Math Olympiad 3^n+2^n=35
 Presenter: Super Academy
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1 The Problem

Given the relation

$$3^n + 2^n = 35\,, \tag{1}$$

find the values of $n \in \mathbb{Z}$.

2 The Solution

From the very start, I'll try a solution by use of a table. And here goes:

n	1	2	3	4	5
2^n	2	4	8	16	32
3^n	3	9	27	81	243
	5	13	35	–	–

Table 1: Heuristic: Solved by Table.

Therefore the answer is $n = 3$. That there are not other integer values is because the curves $f(x) = 2^x$ and $g(x) = 3^x$ will intersect only once over the real numbers.