WORKSHEET

THE ANSWER IS 2025, BUT WHAT IS THE QUESTION?

You can be a creative mathematician, someone who has your own mathematical ideas.
Just investigate a few of these properties of 2025 and calculations that have the answer 2025 or find your own interesting facts about 2025 and calculations with the answer 2025.

What different questions can you find with 2025 as the answer? Perhaps you can make up an easy question, a harder one and one that is very hard. Compare your questions with other people's.

1. For example, you might ask: 'Do you find anything interesting if you reverse the digits of 2025 and add the two numbers together?'

2. You might ask: 'How many 25s are there in 2025?' or 'What are the prime factors of 2025?' or 'How many divisors of 2025 are there?'

3. If you investigate the prime factors of 2025 and write 2025 as a product of its prime factors, you will find that 2025 is a square number. When was the last year that was a square number? When will the next year be that is a square number?

4. The sum of the first n odd numbers is $S_n = n^2$ so 2025 is the sum of the first 45 odd numbers. Check it out! **1 + 3 + 5 + 7 + 9 + …+ 89 = 2025.**

5. Can you write 2025 as the product of 3 squares? Can you write it as the product of 2 squares?

6. 2025 is the sum of two squares **$27^2 + 36^2$**. Check it out.

7. 2025 is the sum of 3 squares. One is 40^2. Can you find the other two?

8. The sum of the natural numbers from 1 to 9 (one of the triangle numbers) is $(9 \times 10)/2 = 45$ so **$(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9)^2 = 2025.$**

9. You might like to investigate the sum of cubes of natural numbers given by the formula $S = [n^2 (n + 1)^2]/4$, where S is the sum and n is the number of natural numbers taken. You will find that **$1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3 + 9^3 = (9^2 \times 10^2)/4 = 2025$**

10. A number is said to be *polite* if it can be expressed as the sum of at least two consecutive natural numbers. The number 2025 is a polite number, it can be written in 14 ways as a sum of consecutive natural numbers, for example, **403 + 404 + 405 + 406 + 407 = 2025**. Can you find all 14 sums of consecutive numbers adding up to 2025?

11. What is the number 2025 written as a binary number?

12. Is it correct to say "twenty twenty-five" or should we say "two thousand and twenty-five" or are both correct? Why? People say "twenty twenty five" so do the 2 twenties mean – 20 thousands, 20 hundreds, 20 tens or 20 units?

What interesting facts can you find about the year that you were born?

HELP

How old are you? If you are 9 years old then write down some interesting calculations that have the answer 9 (or whatever your age is, do the same for your age).

For example all these have the answer 9:

3 × 3 ; half of 18 ; 10 – 1 ; 20 – 11; 16 -7 ; 3^2 ; square root of 81 etc.

See the problem 'I'm Eight'

https://aiminghigh.aimssec.ac.za/years-3-10-i-am-eight/

NEXT

5. How many ways can you arrange the digits 2, 2, 0 and 5 to get different numbers? What is the sum of those numbers?

6. Explore Wild and Wonderful Number Patterns, see http://nrich.maths.org/33
Make up some of your own number patterns.
You've probably come across number patterns before, ones like :-
2 4 6 8 10 12 . . .
512 256 128 64 32 . . .
220 210 200 190 180 170 . . .
11 14 17 20 23 26 . . .
Work out the rules that produced each of the patterns.
What is the reason for the series of dots appearing after each one?
Now make up some of your own number patterns.