

05.02.24

Number Nest Weekly Challenge

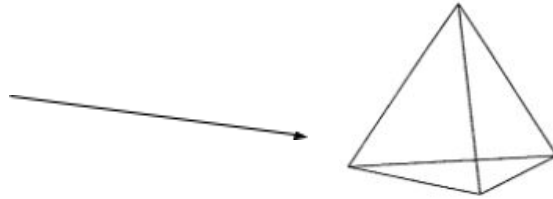


Warm up

- a) $3.8 + 2.19 + 10.08 =$
- b) What is the next number in the sequence

1, 3, 6, 10, 15, ...

- c) What is the name for the type of numbers in question b?
- d) Find 99% of £21.
- e) What is the name of this shape?
- f) How many vertices does it have?



Main challenge

a) When we write the year 2021, we are writing two consecutive two-digit numbers (20 and 21). Find all the other years from 1000 to 2021 that are made up of two consecutive two-digit numbers written in order, and add them to the table on the next page.

b) Find the sum of the consecutive two-digit numbers for each year from part a), and add this to the table below. For example, for 2021, the sum is $20 + 21 = 41$. Describe the pattern formed by these sums.

c) Find the product of the consecutive two-digit numbers for each of the first 5 years in the table. Then find the differences of these products, in order. For example, $10 \times 11 = 110$ and $11 \times 12 = 132$. The difference is $132 - 110 = 22$. You will have five products and four differences.

- (i) What pattern is formed by the differences?
- (ii) Use this pattern to find the remaining products, without multiplying.

d) What sequence of numbers can you form by combining the numbers in the sum column and the difference column?

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Year	Sum	Product	Difference
1011	$10 + 11 = 21$	$10 \times 11 = 110$	-
1112	$11 + 12 = 23$	$11 \times 12 = 132$	$132 - 110 = 22$
2021	$20 + 21 = 41$	$20 \times 21 = 420$	

Challenge

The objective of Magic Hundreds is to make the numbers in each row and column add up to 100. You can do this by adding an extra digit to the numbers in the cells. This extra digit can be before or after a given number.

a)

3	1	7
4	9	1
9	9	4

b)

3	7	2
2	1	2
8	9	5