

Question.

The number $53xy1$ is divisible by 99. Find $x + y$.

Solution.

We know the divisibility rule for the number 99:

First, take any number and add the digits in blocks of two from right to the left:

$$53xy1 \rightarrow 5 \quad 3x \quad y1.$$

Then take that sum $(5+3x+y1)$ and determine if it is divisible by 99. The original number is divisible by 99 if and only if the final number is divisible by 99.

Therefore, we must find the sum $5+3x+y1$, which is divisible by 99.

We have two 2 digits numbers – $3x$, $y1$ and one number that consists of 1 digit only – 5. So we can't receive the number larger than 99 in the sum. Let's find x and y , with which the sum will equal to 99.

y will be 6, because we want to obtain $30+y0=90$, $y0=90-30$.

And x will be 3, because we need $5+x+1=9$, $x=9-1-5$.

We check: $5+33+61=99$, that is divisible by 99.

Answer: $y=6$, $x=3$, $x+y=6+3=9$.