



SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Playing with Numbers

Exercise 16.2

Q.1 If $21y5$ is a multiple of 9, where y is a digit, what is the value of y ?

Sol: Since, $21y5$ is a multiple of 9.

Its sum of digits $2 + 1 + y + 5 = 8 + y$ is a multiple of 9.

So, $8 + y$ is either 0 or 9 or 18 or 27....

This is possible when $8 + y = 9$ or 18 or 27

If $8 + y = 9$

$\Rightarrow y = 9 - 8 = 1$

Q.2: If $31z5$ is a multiple of 9, where z is a digit, what is the value of z ? You will find that there are two answers from the last problem. Why is this so?

Sol: Since, $31z5$ is a multiple of 9.

Sum of digits $3 + 1 + z + 5 = 9 + z$ is a multiple of 9.

So, $9 + z$ is either 0 or 9 or 18 or 27 since z is a digit.

This is possible when $9 + z = 9$ or 18 or 27,...

$\Rightarrow z = 9 - 9$

$\Rightarrow z = 0$

If $9 + z = 18$

$z = 18 - 9 = 9$

Hence, 0 and 9 are two possible answers.

Q.3 If $24x$ is a multiple of 3, where x is a digit, what is the value of x ?

Sol: Since $24x$ is a multiple of 3, its sum of digits $6 + x$ is a multiple of 3; so $6 + x$ is one of these numbers: 0, 3, 6, 9, 12, 15, 18, But since, x is a digit. Therefore, it can only be that $6 + x = 6$ or 9 or 12 or 15, therefore $x = 0$ or 3 or 6 or 9 or 12 or 15. Therefore, $x = 0$ or 3 or 6 or 9. Thus, x can have any of four different values.

Q.4 If $31z5$ is a multiple of 3, where z is a digit, what might be the values of z ?

Sol: It is given that $31z5$ is a multiple of 3.

Sum of its digits is $3 + 1 + z + 5 = 9 + z$ is multiple of 3, so $9 + z$ is one of these numbers 9, 12, 15, so on.

This is possible when $9 + z = 9, 12, 15, 18, \dots$

$$\text{If } 9 + z = 9 \quad \text{or If } 9 + z = 12$$

$$\Rightarrow z = 9 - 9 \quad \Rightarrow z = 12 - 9$$

$$\Rightarrow z = 0 \quad \Rightarrow z = 3$$

Possible values of z are 0 or 3.

$$\text{If } 9 + z = 15 \quad \text{or If } 9 + z = 18$$

$$\Rightarrow z = 15 - 9 \quad \Rightarrow z = 18 - 9$$

$$\Rightarrow z = 6 \quad \Rightarrow z = 9$$

Hence, four possible values of z are 0, 3, 6 and 9.