Playing with Numbers

Ex 16.2

Question 1. If 21 y 5 is a multiple of 9, where y is a digit, what is the value of y?

Solution: Since the number 21y5 is a multiple of 9.

So, the sum of its digits 2 + 1 + y + 5 = 8 + y is a multiple of 9.

∴ (8 + y) is either 0 or 9 or 18 or 27 ...

But since y is a digit, so (8 + y) must be equal to 9.

i.e.,8 + y = 9 ⇒ y = 9- 8= l

Question 2. If 31z5 is a multiple of 9, where z is a digit, what is the value of z?

Solution: Since the number 31z5 is a multiple of 9.

So, the sum of its digits 3 + 1 + z + 5 = 9+ z is a multiple of 9.

∴ (9 + z) is either 0 or 9 or 18 or 27 ...

But since z is a digit, so (9 + z) must be equal to 9 or 18...

i.e., 9 + z = 9 ⇒ z = 9 + z = 18 ⇒ z = 9

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

Solution: Since 24 x is a multiple of 3. So, the sum of its digits 2 + 4 + x = (6 + x) is a multiple of 3.

∴ (6 + x) is one of the numbers 0, 3, 6, 9, 12, 15, 18...

But x is a digit. Therefore, (6 + x) must be equal to 6 or 9 or 12 or 15.

i.e., 6 + x = 6 or 9 or 12 or 15

⇒ x = 0 or 3 or 6 or 9

Thus, x can have any of the four different values, namely, 0,3,6 or 9.

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

Solution: Since 31z5 is a multiple of 3. So, the sum of its digits 3 + 1 + z + 5 = (9 + z) is a multiple of 3.

∴ (9 + z) is one of the numbers 0, 3, 6, 9, 12, 15, 18, ...

But z is a digit. Therefore (9 + z) must be equal to 9 or 12 or 15 or 18.

i.e., 9 + z = 9 or 12 or 15 or 18

⇒ z = 0 or 3 or 6 or 9

Thus, z can have any of the four different values, namely, 0, 3, 6 or 9.