Chapter 16. Playing with Numbers

Question 1

Find the value of A and B in $\begin{array}{r} 5A \\ A5 \\ \hline B9 \end{array}$.

Solution:

A + 5 = 9 ⇒ A = 4

5 + A = B ⇒ B = 5 + 4 = 9.

∴ A = 4, B = 9.

Question 2

Find the value of A in

$$\begin{array}{r} 1A \\ \times A \\ \hline 6A \end{array}$$

Solution:

$A = 5 \quad 15 \times 5 = 75$

Question 3

Find the value of A in $\begin{array}{r} 3A \\ \times A \\ \hline 17A \end{array}$.

Solution:

$A = 5,\ 35 \times 5 = 175.$

Question 4

Find the value of A and B in $\begin{array}{r} A1 \\ 1B \\ \hline 43 \end{array}$.

Solution:

$A + 1 = 4 \Rightarrow A = 3$

$1 + B = 3 \Rightarrow B = 2$

$A = 3,\ B = 2$

Question 5

Find the value of A in $\begin{array}{r} 2A \\ \times A \\ \hline 69 \end{array}$ **.**

Solution:

$$\begin{array}{r} 2A \\ \times A \\ \hline 69 \end{array} \quad A = 3$$

Question 6

If 27*y* is a multiple of 9 where *y* is a digit,. What is the minimum value of *y*.

Solution:

The sum of digits

$2+7+y=9+y=9$

$y=9-9=0$

$y=0$, 270 is divisible by 9.

Question 7

If 54 *x* is a multiple of 3, where *x* is a digit, what is the value of *x*.

Solution:

$5+4+x=9+x$

$x=0 \quad 9+0=9$ divisible by 3

$x=3 \quad 9+3=12$ divisible by 3

$x=6 \quad 9+6=15$ divisible by 3

$x=9 \quad 9+9=18$ divisible by 3

$\therefore \ x=0,3,6 \ or \ 9$.

Question 8

Check the divisibility of 34567 by 9.

Solution:

The sum of the digits is 3 + 4 + 5 + 6 + 7 = 25. This number is not divisible by 9.

Therefore 34567 is not divisible by 9.

Question 9

Check the divisibility of 56748 by 3.

Solution:

The sum of digits is 5+6+7+4+8 = 30 is divisible by 3

By the actual division $\frac{56748}{3}=18916$

∴ 56748 is divisible by 3.

Question 10

Check the divisibility of 7986 by 9.

Solution:

The sum of digits is 7+9+8+6 = 30

30 is not divisible by 9

Therefore 7996 is not divisible by 9.

Question 11

Check the divisibility of 58671 by 9.

Solution:

The sum of digits is 5+8+6+7+1 = 27.

27 is divisible is 9.

58671 is divisible by 9.

Question 12

23z is a multiple of 9. Find the value of z.

Solution:

The sum of digits is 2+3+z=9

5+z=9

$z=9-5=4 \Rightarrow z=4$

∴ The number 234 is divisible by 9.

Question 13

Check the divisibility of 5386 by 2.

Solution:

The one's digit of 5386 is 6. 6 it is divisible by 2.

Therefore 5386 is divisible by 2.

Question 14

Check the divisibility of 5005 by 5.

Solution:

The one's digits of 5005 is 5. 5 is divisible by 5.

5005 it is divisible by 5.

Question 15

If 11*z*3 is a multiple of 9 where *z* is a digit, what is the value of *z*?

Solution:

Sum of digits $1 + 1 + z + 3 = 5 + z = 9$

$z = 9 - 5 = 4 \Rightarrow z = 4$

1143 is divisible by 9.

Question 16

If 43*x*1 is a multiple of 3 where *x* is a digit. What is the value of *x*.

Solution:

$4 + 3 + x + 1 = 8 + x$

$x = 1 \quad 8 + 1 = 9$ divisible by 3

$x = 4 \quad 8 + 4 = 12$ divisible by 3

$x = 7 \quad 8 + 7 = 15$ divisible by 3

$x = 10 \quad 8 + 10 = 18$ divisible by 3

Hence *x* can take the values 1, 4, 7, 10.

Question 17

12*z* is a multiple of 9, what is the value of *z*?

Solution:

$1 + 2 + z = 3 + z$

$z = 6 \quad 3 + 6 = 9$ is divisible by 9

$\therefore$ 126 is divisible by 9

The value of z is 9.

Question 18

Check the divisibility of 19 by 10.

Solution:

The one's digit is 9, so 19 is not divisible by 10.

Question 19

Check the divisibility of 25 by 5.

Solution:

The one's digit is 5, so 25 is divisible by 5.

Question 20

Check the divisibility of 23 by 2.

Solution:

The one's digit is 3, so 23 is not divisible by 2.