RD SHARMA

Solutions

Class 8 Maths

Chapter 5

Ex *5.3*

Solve each of the following Cryptarithms:

Q1.

$$\begin{array}{r} 3\ \ 7 \\ +A\ \ B \\ \hline 9\ \ A \end{array}$$

Soln:

Two possible values of A are :

(i) If 7 + B $\leq$ 9 3 + A = 9

∴ A = 6

But if A = 6, 7 + B must be larger than 9.

Hence, it is impossible.

(ii) If 7 + B $\geq$ 9

∴ 1 + 3 + A = 9

=> A = 5

1f A = 5 and 7 + B = 5,

B must be 8

∴ A = 5, B = 8

Q2.

$$\begin{array}{r} A\ \ B \\ +3\ \ 7 \\ \hline 9\ \ A \end{array}$$

Soln:

Two possibilities of A are :

(i) If B + 7 < 9,

A = 6

But clearly, if A = 6,

B + 7 $\geq$ 9;

it is impossible

(ii) If B + 7 $\geq$ 9,

A = 5 and B + 7 = 5

Clearly, B = 8

∴ A = 5, B = 8

Q3.

$$\begin{array}{rr} A & 1 \\ +1 & B \\ \hline B & 0 \end{array}$$

Soln:If 1 + B = 0 Surely, B = 9

If 1 + A + 1 = 9 Surely, A = 7

Q4.

$$\begin{array}{rrr} 2 & A & B \\ +A & B & 1 \\ \hline A & B & 1 \end{array}$$

Soln:

B + 1 = 8, B = 7A + B = 1, A + 7 = 1, A = 4

So, A = 4, B = 7

Q5.

$$\begin{array}{rrr} 1 & 2 & A \\ +6 & A & B \\ \hline A & 0 & 9 \end{array}$$

Soln:

A + B = 9 as the sum of two digits can never be 192 + A = 0, A must be 8A + B = 9, 8 + B = 9, B = 1

So, A = 8, B = 1

Q6.

$$
\begin{array}{r}
A\ \ B\ \ 7 \\
+7\ \ A\ \ B \\
\hline
9\ \ 8\ \ A
\end{array}
$$

Soln:

If A + B = 8, A + B $\geq$ 9 is possible only if A = B = 9 But from 7 + B = A, A = B = 9 is impossible. Surely, A + B = 8, A + B $\leq$ 9

So, A + 7 = 9, Surely A = 27 + B = A, 7 + B = 2, B = 5

So, A = 2, B = 5

Q7. Show that the Cryptarithm $4 \times \overline{AB} = \overline{CAB}$ does not have any solution.

Soln:

0 is the only unit digit number, which gives the same 0 at the unit digit when multiplied by 4. So, the possible value of B is 0. Similarly, for A also, 0 is the only possible digit. But then A, B and C will all be 0, and if A, B and C become 0, these numbers cannot be of two — digit or three — digit. Therefore, both will become a one — digit number. Thus, there is no solution possible.