

Numerical Puzzles 1: Runaway Digits

1. Marcus wrote an equality on the board. The trickster Grayson erased three digits and replaced them with at-signs, so it became this:

$$@ + @ = @8$$

Restore the original equality. How many solutions are there? Why?

2. It happened again! Find a solution(s)

$$@@5 - @@ = 8$$

3. Restore the missing digits:

$$\begin{array}{r} @9@ \\ + @7 \\ \hline @@43 \end{array}$$

4. Restore the missing digits:

$$\begin{array}{r} * * 7 1 \\ - * 9 * \\ \hline * 3 \end{array}$$

5. Restore the missing digits:

$$\begin{array}{r}
 \times \quad ** \\
 \quad 52 \\
 \hline
 \quad *4 \\
 \quad ** \\
 \hline
 8
 \end{array}$$

6. Restore the missing digits:

a)

$$\begin{array}{r}
 \quad ** \\
 + \quad * \\
 \hline
 **8
 \end{array}$$

b)

$$\begin{array}{r}
 \quad *6* \\
 + \quad 2*5 \\
 \hline
 638
 \end{array}$$

c)

$$\begin{array}{r}
 \quad 83 \\
 \times \quad ** \\
 \hline
 \quad *3 \\
 1** \\
 \hline

 \end{array}$$

7. Replace all the asterisks with digits from 0 to 9 in such a way as to get the correct equalities.

a)

$$\begin{array}{r}
 \quad *93 \\
 + \quad ** \\
 \hline
 **51
 \end{array}$$

b)

$$\begin{array}{r}
 \quad 29 \\
 \times \quad ** \\
 \hline
 \quad *7 \\
 \quad ** \\
 \hline
 3**
 \end{array}$$

c)

$$\begin{array}{r}
 \quad ** \\
 \times \quad *8 \\
 \hline
 \quad ** \\
 \quad ** \\
 \hline
 3*6
 \end{array}$$