

Pick any three digit number.

Reverse the digits, so write your number back to front.

Subtract the smaller of your two numbers from the larger one.

Now reverse the digits of the answer you get.

Add the answer to its reverse.

$$\begin{array}{r} 723 \\ - 327 \\ \hline 396 \\ + 693 \\ \hline 1089 \end{array}$$

$$\begin{array}{r} 856 \\ - 658 \\ \hline 198 \\ + 891 \\ \hline 1089 \end{array}$$

$$\begin{array}{r} 392 \\ - 293 \\ \hline 099 \\ + 990 \\ \hline 1089 \end{array}$$

Choose some three-digit numbers of your own.

(Make sure the first and third digits are different)

Is there a pattern to all the answers?

Look at the calculations again. This time, the working is shown.

$$\begin{array}{r} 7^6 2^1 3 \\ - 3 2 7 \\ \hline 3 9 6 \\ + 6 9 3 \\ \hline 1 0^1 8 9 \end{array}$$

$$\begin{array}{r} 8^7 5^4 6 \\ - 6 5 8 \\ \hline 1 9 8 \\ + 8 9 1 \\ \hline 1 0^1 8 9 \end{array}$$

$$\begin{array}{r} 3^2 9^8 2 \\ - 2 9 3 \\ \hline 0 9 9 \\ + 9 9 0 \\ \hline 1 0^1 8 9 \end{array}$$

What is the same in each example?

What is different?

Does every example lead to the same answer?

Can you prove it by using what you noticed by looking at the working?