



### Math Magic Session 1

Pick a three digit number. The three numbers used must be different\*. i.e. 123. Reverse that number. Take the smallest three digit number from the largest. Take the answer and reverse that number. Add that number to the answer of the subtraction. And your Answer is.....



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# Why is it always 1089

You will need a little bit of [algebra](#).  
But stick with it, it is not difficult.

Represent the number with ABC



Reverse this to get CBA



Remember that A is Hundreds B is tens and C is units  
Take CBA from ABC like this



	Hundreds	Tens	Units
	A	B	C
—	C	B	A



Now here is the trick: subtract 1 Hundred, and add 9 Tens and 10 Ones (-100, +90, +10 = 0, so won't change answer):

	Hundreds	Tens	Units
	A-1	B+9	C+10
—	C	B	A
	<b>A-1-C</b>	<b>9</b>	<b>10+C-A</b>



Last Step: Reverse the answer and add the two numbers together.

	A-1-C	9	10+C-A
+	10+C-A	9	A-1-C
	9	18	9
		(simplify:)	
	10	8	9

As predicted the answer was 1089