Evaluate It and Back Again

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Let's pick a positive integer X without leading or trailing zeros. Consider an expression `X+X-0`. Its value is $2X$, but the reversed expression evaluates to `0-rev(X)+rev(X)=0`. Let's call this expression `f(X)`. The result of evaluating `f(X)` is $2X$ and the result of evaluating `rev(f(X))` is 0. Thus, when both p and q are even, `f(`$\frac{p}{2}$`)+rev(f(`$\frac{q}{2}$`))` is a possible answer. For negative X, define `f(X)` to be `0-|X|-|X|`.

When p or q is odd, let's make both of them even. First, if they have different parities, add `12+` in the beginning. This would add 12 to the value of p and 21 to the value of q, so now they have the same parity. If they are both odd, append `+1`.

The remaining issue to be solved is that p and q might have trailing zeros. This can be solved by adding `+x` instead of `+1` in the last step (such `x` that makes p and q both even, but not ending with 0, always exists). The maximum length of such an expression is $4 + 2 \cdot (4 + 2 \cdot \texttt{len}(\frac{p}{2})) \leq 84$.

The larger limit on the length of the answer allowed for many other approaches. For example, you can use the fact that `12-4*4+5` is a solution for $p = 1$, $q = 0$, multiply it by any number, and add it with its reverse. Another approach (yielding significantly longer expressions) is to use numbers like `xx..xx` (or palindromes in general), `xx..xy..yy`, `9*9*...*9*x` to make the input numbers (either p and q independently, or, their difference and an offset). Depending on the specific construction, this type of solution also has a good chance to pass the tests.