

Kwantlen Polytechnic University

Mathematics Problem 282:

There was no winner for Problem 282.



A parade group finds itself one person short. They form up in rows of 10, but find that they have one space in the last row. They know that 11 will not work, so they try rows of 9, 8, 7, etc., all the way down to 2. There is always one space in the last row. Eventually, the leader gives up and settles with single file. How many marchers are there at a minimum?

Partial Solution provided by James Guerry:

Let P be the number of marchers in the parade. Since P is one short of being a multiple of 10, 9, 8, 7, etc., then $P+1$ must be a multiple of 10, 9, 8, 7, etc.

Since we are looking for the minimum number of marchers, we will let $P+1$ be the LCM of the numbers 2 through 10, which is 2520.

Therefore, P must equal $2520 - 1 = 2519$ which does not work as 2519 is divisible by 11.

So the least possible number would be $(2 \times 2520) - 1 = 5039$.