

# 2021 Fall AMC 12B Problems/Problem 1

The following problem is from both the 2021 Fall AMC 10B #1 and 2021 Fall AMC 12B #1, so both problems redirect to this page.

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## Problem

What is the value of  $1234 + 2341 + 3412 + 4123$ ?

(A) 10,000      (B) 10,010      (C) 10,110      (D) 11,000      (E) 11,110

## Solution 1

We see that 1, 2, 3, and 4 each appear in the ones, tens, hundreds, and thousands digit exactly once. Since  $1 + 2 + 3 + 4 = 10$ , we find that the sum is equal to

$$10 \cdot (1 + 10 + 100 + 1000) = \boxed{\text{(E)} 11,110}.$$

Note that it is equally valid to manually add all four numbers together to get the answer.

~kingofpineapplz

## Solution 2

We have

$$1234 + 2341 + 3412 + 4123 = 1111(1 + 2 + 3 + 4) = \boxed{\text{(E)} 11,110}.$$

~Steven Chen (www.professorchenedu.com)

## Solution 3

We see that the units digit must be 0, since  $4 + 3 + 2 + 1$  is 0. But every digit from there, will be a 1 since we have that each time afterwards, we must carry the 1 from the previous sum. The answer choice that satisfies these conditions is

$\boxed{\text{(E)} 11,110}.$

~~stjwyl

## Video Solution by Interstigation

[https://youtu.be/p9\\_RH4s-kBA](https://youtu.be/p9_RH4s-kBA)

## See Also

|  |                                 |
|--|---------------------------------|
| <b>2021 Fall AMC 10B (Problems • Answer Key • Resources (<a href="http://www.artofproblemsolving.com/community/c13">http://www.artofproblemsolving.com/community/c13</a>))</b> |                                 |
| Preceded by<br><b>First Problem</b>  | Followed by<br><b>Problem 2</b> |
| 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • 10 • 11 • 12 • 13 • 14 • 15 • 16 • 17 • 18 • 19 • 20 • 21 • 22 • 23 • 24 • 25  |                                 |
| <b>All AMC 10 Problems and Solutions</b>   |                                 |
| <b>2021 Fall AMC 12B (Problems • Answer Key • Resources (<a href="http://www.artofproblemsolving.com/community/c13">http://www.artofproblemsolving.com/community/c13</a>))</b> |                                 |
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