2021 AMC 10A Problems/Problem 1

Contents

Problem

What is the value of

$$(2^2 - 2) - (3^2 - 3) + (4^2 - 4)$$

$(\textbf{A})\ 1 \qquad (\textbf{B})\ 2 \qquad (\textbf{C})\ 5 \qquad (\textbf{D})\ 8 \qquad (\textbf{E})\ 12$

Solution 1

$(4 - 2) - (9 - 3) + (16 - 4) = 2 - 6 + 12 = 8.$ This corresponds to $\boxed{(\textbf{D})\ 8}$.

-happykeeper

Solution 2

We have

$$
\begin{aligned}
(2^2 - 2) - (3^2 - 3) + (4^2 - 4) &= 2(2 - 1) - 3(3 - 1) + 4(4 - 1) \\
&= 2(1) - 3(2) + 4(3) \\
&= 2 - 6 + 12 \\
&= \boxed{(\textbf{D})\ 8}.
\end{aligned}
$$

~MRENTHUSIASM

Solution 3 (Overkill: Just for Fun)

We have

$$
\begin{aligned}
(2^2 - 2) - (3^2 - 3) + (4^2 - 4) &= \overline{2^2 + 4^2} - 3^2 - 2 + 3 - 4 \\
&= 2^2 + (4 - 3)(4 + 3) - 3
\end{aligned}
$$

$$= 2^2 + 7 - 3 = 2^2 + 4$$
$$= 4 \cdot 2$$
$$= \boxed{\textbf{(D) } 8}.$$

-PureSwag

Video Solution 1 (Lightning Fast)

https://youtu.be/cAMg15KhK6E

~ Education, the Study of everything

Video Solution 2

https://youtu.be/cAMg15KhK6E

Video Solution 3 (Very Very Quick Computation)

https://www.youtube.com/watch?v=m0_UMI2mnZs&list=PLexHyfQ8DMuKqltG3cHT7Di4jhVl6L4YJ&index=2 ~North America Mathematic Contest Go Go Go

Video Solution 4 (Quick Computation)

https://youtu.be/C3n2hgBhyXc?t=37 ~ThePuzzlr

Video Solution 5 (Arithmetic Computation)

https://youtu.be/0VvM_f-IDvE

~ pi_is_3.14

Video Solution 6

https://youtu.be/4dkzuRHJieQ

~savannahsolver

Video Solution 7

https://youtu.be/50CThrk3RcM

~IceMatrix

Video Solution 8 (Problems 1-3)

https://youtu.be/CupJpUzKPB0
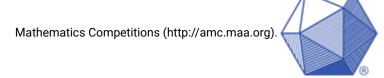
~MathWithPi

Video Solution 9

https://youtu.be/slVBYmcDMOI

~TheLearningRoyal

See Also

2021 AMC 10A (**Problems · Answer Key** · Resources (http://www.artofproblemsolving.com/community/c1
3))

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All AMC 10 Problems and Solutions	