

2021 AMC 10A Problems/Problem 1

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Problem

What is the value of

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

(A) 1 (B) 2 (C) 5 (D) 8 (E) 12

Solution 1

$(4 - 2) - (9 - 3) + (16 - 4) = 2 - 6 + 12 = 8$. This corresponds to **(D) 8**.

-happykeeper

Solution 2

We have

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

~MRENTHUSIASM

Solution 3 (Overkill: Just for Fun)

We have

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

$$\begin{aligned}
 &= 2^2 + 7 - 3 = 2^2 + 4 \\
 &= 4 \cdot 2 \\
 &= \boxed{(D) 8}.
 \end{aligned}$$

-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=PLexHyfQ8DMuKqItG3cHT7Di4jhVI6L4YJ&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_fIDvE

~ 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/sIVBYmcDMOI>

~TheLearningRoyal

See Also

2021 AMC 10A (Problems • Answer Key • Resources (http://www.artofproblemsolving.com/community/c13)	
Preceded by First Problem	Followed by Problem 2
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