

Hi, I'm Greg. I'm a NYC tutor! I love helping students. I tutor many subjects, assist with homework help, etc. I mainly specialize in specialized tests.

As it turns out, I haven't been able to get to do as many livestreams as I have in past years (yet, hopefully that changes). Therefore, I thought it would be fun to start a Problem Of The Day Series. I will put up a problem and leave it running for a while. You guys will then analyze it, and come up with possible solutions and alternative solutions on your own. I'll eventually post the answer in some manner.

For now we'll play it by ear how that will happen and for how long I'll leave up a problem. But right now I'm thinking of keeping the problem up maybe 2 hours minimum and maybe even in some cases 4 or 5 hours depending upon the dynamics and my situation. Unlike my AMA (Ask Me Anything) lifestream sessions, I will not be checking in every few minutes although I may from time to time join into the discussion. Again, the idea is for you guys to discuss out the problem.

Please be respectful to each other in this endeavor and let's make this fun, educational and forward-thinking. Keep the comments within the spirit of what I'm doing here. Please email me at GregsTutoringNYC@gmail.com if needed.

HERE'S THE PROBLEM: <—
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The average of 5 consecutive even integers is 0. What is the sum of the negative difference of the greatest and least integer of this set and the positive difference of the greatest and least integer of this set?

HERE'S THE SOLUTION:
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If we solve the first part of this question logically we see that if there are 5 even integers and their average is 0, then if we look at this on a traditional number line then 0 must be the center number. And then therefore the two even integers to the right must be 2 and 4, and the two even integers to the left must be -2 and -4. And that's our set of 5 even integers: -4, -2, 0, 2, 4

Algebraically we could solve this first part thus as an alternate approach to obtain the set of integers:

$$x, x + 2, x + 4, x + 6, x + 8$$

as 5 consecutive numbers each two apart. (There are other ways to set this up, but this to me is the clearest way.) We're told their average is 0.

$$\therefore \frac{\text{the sum of the numbers}}{5} = 0$$

$$\therefore \frac{x + (x + 2) + (x + 4) + (x + 6) + (x + 8)}{5} = 0$$

$$\frac{5x + 20}{5} = 0$$

$$5x + 20 = 0$$
$$5x = -20$$
$$x = -4$$

If again the integers were symbolically as:

$$x, x + 2, x + 4, x + 6, x + 8$$

Upon substituting x we therefore have:

$$-4, -2, 0, 2, 4$$

the same even values as we got logically above.

Now that we know the integers, let's explore the second part of this question.

Difference means subtraction.

The negative difference of the greatest and least integer:

$$-4 - 4 = -8$$

The positive difference of the greatest and least integer:

$$4 - -4 = 4 + 4 = 8$$

The sum of the negative difference and the positive difference:

$$-8 + 8 = 0$$

When you think about this logically, as we did earlier for the first part of the question, as the average is zero the integers are going to be "balanced" on both sides of zero, therefore, the sum of the differences must also be zero since they are opposite signs and "balanced" too.

- Greg / GregsTutoringNYC@gmail.com LLAP ☺