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 sum of four consecutive multiples of 7 yields 210. What is the sum of all the positive factors of the third multiple?

HERE'S THE SOLUTION:
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We can "easily" solve this algebraically. Four multiples of 7 can be added thus:

$7x + 7(x + 1) + 7(x + 2) + 7(x + 3) = 210$

.: expanding:
$7x + 7x + 7 + 7x + 14 + 7x + 21 = 210$
$28x + 42 = 210$
$\quad -42 \quad -42$
$28x = 168$
$/28 \quad /28$
$x = 6$

.: $7x = 42$

.: Our numbers are: 42, 49, 56, 63
$42 + 49 + 56 + 63 = 210$ checks out

.: The third multiple is: 56

An alternative solution follows. As 210 is the sum of the 4 multiples, let's just get their average:

$\quad 210 / 4 = ?$ Well $/ 2 = 105$ and $/2$ again $= 52.5$

So we'd have:

  first, second, third, fourth

52.5 is smack between second and third.

.: a multiple of 7 immediately higher than 52.5 must be the answer.
.: Third is 56

You could also brute force it by maybe starting with a guess of 50, bringing that up or down to a multiple of 7, and then figure which should be the first (or last) in order to

obtain the multiples of 7 sum sought.

We still need to obtain the sum of the factors of the third multiple.

The factors of 56 are: 1, 2, 4, 7, 8, 14, 28, 56
Their sum is 120

— Greg / GregsTutoringNYC@gmail.com   LLAP ☺