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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Set L is thus:

L = { 7, 11, 13, 16, 19, 25, 28, 31, 33, 36, 37 }

The average of the numbers within set L would be 22 except for one number which doesn't belong. Which number doesn't belong?

HERE'S THE SOLUTION:
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The total of the numbers in set L is 256

There are 11 numbers in set L

∴ average of L is 256 / 11 = 23.$\overline{27}$

That's unhelpful though. However, if we divide the total by the target average we get:

256 / 22 we get 11.$\overline{63}$

Using the whole number part of that means 22 x 11 = 242 of the 256 is accounted for.

If we subtract that from 256 we get 256 − 242 = 14

14 is not one of the numbers. But if we add 22 to it we get 14 + 22 = 36 and 36 is the number that throws off the sought average of 22. We added 22 because when we divided 256 it turns out that 22 units of the 36 got included in that as 36/22 ~= 1.63.. in other words one 22 plus about 63/100 of a 22 (and about 63/100 of a 22 is the 14).

Another way to approach this was to note that we could make pairs within the set that add up to 44. This is significant because 44/2 is 22. So once we pair those up, whatever is unpaired and/or not 44 might be the candidate we're looking for.

So the pairs we get are 7/37, 11/33, 13/31, 16/28, and 19/25. The only one outstanding number left is 36.

Another way it to remove each number in turn and calculate the average. This is tedious, error-prone and slow.

Saving the best for last: If one number doesn't belong, and there are 11 numbers in set L,

then only 10 numbers belong. If the average of those 10 number is 22, that means their sum must be 220. But the total of the 11 numbers was 256, therefore 256 – 220 = 36. Ba-ba-ba-booyah!

This tends to be more a number sense problem and logical reasoning problem in addition to math notions such as averages and sets.

– Greg / GregsTutoringNYC@gmail.com   LLAP 🖖