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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Two students enjoy eating some nuts during a study break. One student finds a 30% salt mixture just right while the other prefers a 15% salt mixture. How many ounces of the second student's mixture type will they have to mix in to make 60 ounces of a 20% salt nut mix as a compromise?

HERE'S THE SOLUTION:
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If
f represents the first mixture
s represents the second mixture

then
f + s = 60
30%f + 15%s = 20% x 60

Let's normalize these together.

One way to do that is with substitution, as from the first equation we can also get:
f = 60 – s   and
s = 60 – f

So let's choose to substitute f into the second equation:

30%(60 – s) + 15%s = 20% x 60

which means that we have effectively removed f and now only need to solve for s:

30% x 60 – 30%s + 15%s = 20% x 60
30% x 60 – 15%s = 20% x 60
30% x 60 – 20% x 60 = 15%s
10% x 60 = 15%s
s = 40
.: f = 20

Feeding those values into the second equation to double check we get:

30%f + 15%s = 20% x 60
30% x 20 + 15% x 40 = 20% x 60
6   + 6   = 12
12 = 12

That is solving for f and s using substitution. We could also solve this with simultaneous equations whereas we balance the two equations against each other. We do this by trying to removing one of the variables by normalizing the one equation against the other.

First, since every term of the second equation is divided by 100 will just x 100 on each term for convenience effectively throwing it away, yielding:

30f + 15s = 20 x 60 = 1200

Since the first equation is

f + s = 60

then we look to cancel out the f's or the s's. In this case either will work. We can do this by multiplying each term in the first equation by 30 or 15 depending upon whether we want to knock out f or s. So let's use 30:

30(f + s = 60)
30f + 30s = 1800

Now we just subtract the two equations:

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   30f + 30s = 1800
-  30f + 15s = 1200
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    0  + 15s = 600
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If 15s = 600 .: s = 40

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