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

What is this? I don't always have time to do a livestream, therefore instead I thought it would be fun to do a Problem Of The Day series. In this series I will put up a problem and 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 the past this has resulted in many interesting discussions. Some questions will be easy, others hard, some perhaps with a twist, some will be SHSAT 8 oriented while some SHSAT 9 oriented.

I'll leave a problem up for about an hour, however depending upon the dynamics and complexity of the question it could be much longer. Unlike my AMA (Ask Me Anything) livestream sessions, I may not always be able to join in the discussion. Again, the idea is for you guys to discuss things out.

Please be respectful in this endeavor. Let's keep this fun, educational, and forward–thinking. Keep your comments within this spirit. If needed, feel free to email me at GregsTutoringNYC@gmail.com. Past questions are at https://www.GregsTutoringNYC.com/POTD

HERE'S THE PROBLEM: <——
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A bag contains 100 bills that are in denominations of $2, $20, $10, and $50. The ratio of $20 to $10 bills is 20 : 10, there are 20 $2 bills, and the ratio of $50 to $20 bills is 100 : 40. If 2 $20 bills are removed and replaced with 2 $10 bills, what will t be in the ratio 100 : t reflecting the final ratio of $50 to $10 bills?

HERE'S THE SOLUTION:
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It's often handy to align ratios. For 100 : 40 to align with 20 : 10 we can using proportions bring the latter to 40 : 20. That will yield a ratio of $50 : $20 : $10 of 100 : 40 : 20. That gives 160 parts. But as we only have 100 bills in total, I'd rather not work with that.

Instead I could have brought the 100 : 40 to 50 : 20. That will yield a ratio of $50 : $20 : 10 of 50 : 20 : 10 containing 80 parts. This is just adjusting proportions. We could have also just divided each term of 100 : 40 : 20 by 2 as well.

Having 80 parts is ok, because since there are 20 $2 bills, that means we have 80 bills (100 – 20) of the other denominations. Perfect!

Now if I remove 2 $20s I have 20 – 2 = 18 $20s, and if I add 2 $10s I have 10 + 2 = 12 $10s.

That yields a new ratio of $50 : $20 : $10 as 50 : 18 : 12 still containing 80 parts.

This means that the new ratio of $50 : $10 is now 50 : 12 which is the same as 100 : 24. Therefore, t is 24.

– Greg / GregsTutoringNYC@gmail.com   LLAP ☺