

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) livestream 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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Jar 1 and Jar 2 each contain $\frac{1}{2}$ cup of water. If $\frac{1}{4}$ of the water in Jar 1 is poured into Jar 2, both their water volume is increased 4-fold, and then $\frac{1}{8}$ of a cup of water in Jar 2 is poured into Jar 1, what is the difference in water level between Jar 1 and Jar 2?

HERE'S THE SOLUTION:
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This example is based on problem 68 of the 2020–2021 SHSAT Handbook. I normally do problems from scratch but figured it was worth pointing out this problem, and of course add a spin to it. Phrasing and attention to detail matter.

If $\frac{1}{4}$ of the water (note this does not say $\frac{1}{4}$ cup of water, but $\frac{1}{4}$ of the total water) in Jar 1 is transferred that is

$$\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$

So Jar 1 now has $\frac{1}{2} - \frac{1}{8} = \frac{4}{8} - \frac{1}{8} = \frac{3}{8}$ of water left

And Jar 2 now has $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$

If both their current volume is increased by 4-fold that means

$$\text{Jar 1} = 4 \times \frac{3}{8} = \frac{12}{8}$$

$$\text{Jar 2} = 4 \times \frac{5}{8} = \frac{20}{8}$$

If $\frac{1}{8}$ OF A CUP is now poured from Jar 2 into Jar 1, then:

$$\text{Jar 1} = \frac{12}{8} + \frac{1}{8} = \frac{13}{8}$$

$$\text{Jar 2} = \frac{20}{8} - \frac{1}{8} = \frac{19}{8}$$

Their difference is $\frac{19}{8} - \frac{13}{8} = \frac{6}{8} = \frac{3}{4}$

– Greg / GregsTutoringNYC@gmail.com LLAP ☺