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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Self-serve coffee is available in a cafeteria. Initially a container is partially filled with n gallons of hot water. Just as breakfast started, the staff noticed it was under 50% full and added 48 more quarts of hot water to the container making it 50% full. Expecting lots of business, the staff immediately added 6 more gallons of hot water to the container making it 74% full. What is the value of 50% of n in gallons?

HERE'S THE SOLUTION:
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We know from the last addition of hot water that 6 gallons is 24% (74% - 50%) of the capacity of the container.

As 1 gallon = 4 quarts, therefore 48 quarts is 12 gallons (could have set this up as a proportion). Since 6 gallons is 24% then 12 gallons is 48% (could have set this up as a proportion).

This means that 18 gallons take up 72% of the container. Hence, to compute the full capacity of the container:

$$\frac{18}{72} = \frac{x}{100}$$

$$18 \times 100 = 72x$$
$$\frac{}{72} \qquad \frac{}{72}$$
$$.25 \times 100 = x$$
$$25 = x$$.: 25 gallons .: 50% capacity = 12.5 gallons

If adding 12 gallons (48%) makes the container 50% full then 0.5 gallon (12.5 - 12) is 2% (50% - 48%).

We could have skipped these last steps as if 6 gallons is 24% then 1 gallon is 4%, and then 2% is 0.5 gallon, the amount of water initially in the container.

Either way, 50% of 0.5 is 0.25 gallons.

Double check: Initially there was 0.5 gallons (.5/25 = 2%) of hot water. Just as breakfast started, the staff added 12 gallons (12/25 = 48%) making it 2 + 48 = 50% full. Adding 6 more gallons (6/25 = 24%) making it 50 + 24 = 74% full.

- Greg / GregsTutoringNYC@gmail.com   LLAP ☮