

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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The constant of proportionality between lunch and dinner customers, respectively, at a restaurant is represented as 0.875. The proportional relationship between Monday and Saturday customers, respectively, at the same restaurant is represented as 0.125. If 112 customers eat lunch on a Monday, how many customers will eat dinner on a Saturday?

HERE'S THE SOLUTION:

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If the ratio of lunch to dinner (lunch : dinner) is 0.875 then

$$\begin{aligned} ml &= 0.875 md \\ 112 &= 0.875 md \\ /0.875 \quad /0.875 \\ 112 / 0.875 &= 128 = md \end{aligned}$$

In other words, for Monday dinner there will be 128 customers.

If the Monday to Saturday dinner ratio (Monday dinner : Saturday dinner) is 0.125 then

$$\begin{aligned} md &= 0.125 sd \\ 128 &= 0.125 sd \\ /.125 \quad /.125 \\ 128 / .125 &= 1024 = sd \end{aligned}$$

In other words, for Saturday dinner there will be 1024 customers.

It's computationally intensive to use .125 and .875. Even if we observe that

$$\begin{aligned} ml &= 0.875 md \\ md &= 0.125 sd \\ \therefore ml &= 0.875(0.125 sd) = 0.109375 sd \text{ (ugh!)} \\ \therefore sd &= ml / 0.109375 = 112 / .109375 = 1024 \text{ (ugh, ugh!)} \end{aligned}$$

That's a messy multi-digit decimal calculation, but the following less so. One could notice that the decimals given are 1/8 and 7/8 respectively. That would have made the alternative $112 \times 8/7$ and $128 \times 8/1$ more manageable and efficient computations when computing md and sd above.

$$\begin{aligned} ml &= 7/8 md \quad \text{and} \quad md = 1/8 sd \\ \therefore ml &= (7/8)(1/8 sd) = 7/64 sd \\ \therefore sd &= 64 ml / 7 = 64 \times 112 / 7 = 7168 / 7 = 1024 \\ \text{or observe that } 112 / 7 &\text{ cancels to } 16, \text{ hence } 64 \times 16 = 1024 \end{aligned}$$

- Greg / GregsTutoringNYC@gmail.com LLAP ☺