Problem of the Week
Problem D and Solution
The Flavour Foundry

Problem

Salt and Pepper are chefs scaling up a recipe for a large banquet. The total amount of dried garlic needed is 60% more than what Salt has in stock and 80% more than what Pepper has in stock. After combining the amounts they have in stock, they find they have more than necessary. What percentage over the required amount do they have? Round your answer to the nearest tenth of a percent.

Solution

Let g be the total required amount needed in kg, s be Salt's amount, in kg, p be Pepper's amount, in kg.

Since the required amount is 60% more than the amount Salt has, then $g = 1.60s = \frac{8}{5}s$, or $s = \frac{5}{8}g$.

Similarly, since the required amount is 80% more than the amount Pepper has, $g = 1.80p = \frac{9}{5}p$, or $p = \frac{5}{9}g$.

Let t be the total amount Salt and Pepper have, in kg.

Now,

$$\begin{aligned} t &= s + p \\ &= \frac{5}{8}g + \frac{5}{9}g \\ &= \left(\frac{5}{8} + \frac{5}{9}\right) g \\ &= \left(\frac{45}{72} + \frac{40}{72}\right) g \\ &= \frac{85}{72}g \\ &= \left(1 + \frac{13}{72}\right) g \end{aligned}$$

Therefore, the total amount Salt and Pepper have exceeds the required amount by $\frac{13}{72} \times 100\%$, which is approximately 18.1%.