



Cooking Doesn't Require Calculus

The title ("calculus") and words in the opening text ("calculated", "formula", "operations") imply that we'll need to be doing some math in this puzzle.

Each instruction applies to one ingredient, and heavily suggests some mathematical operations. For each one, we start with the number in the quantity column of the relevant ingredient (implied by "use the suggested quantities as a starting point"), execute the operations suggested, and then *index* into the ingredient name using the result (i.e. if the result is "6" and the ingredient is "whole wheat bread", we take the sixth letter, W)

"Marinate the brussels sprouts by adding 2 tablespoons of vinegar"

- We add 2 to the quantity of brussels sprouts (6) to get 8, which gives the letter S (BRUSSELS **S**PROUTS)

"Use the peanut shells to construct decorative 2-room log cabins."

- This instruction implies taking the base 2 logarithm of the quantity of peanut shells (32). $\log_2(32) = 5$, so this gives the letter U (WAL**U**TS)

"Cube the pineapples. Set aside 3, and divide the rest into 4 portions."

- Implies we should cube the quantity of pineapples ($3^3 = 27$), remove 3 ($27 - 3 = 24$), then divide by 4. The result is $24/4 = 6$, which gives the letter P (PINE**P**PLES)

"Mix the sauce using the condensed milk as a base. To raise the base quality, use 3 pinches of flour."

- The language chosen here implies that we want to raise the quantity of the condensed milk (2) to the power of 3 ($2^3 = 8$). This gives the letter E (CONDENSE**E** MILK)

“Take the puff pastry and fluff into a square”

- Similar to before, this implies we want to square the quantity of puff pastry (3). $3^2 = 9$, which gives the letter R (PUFF PASTRY)

The letters spell out the answer to the puzzle, **SUPER**.

Editor Notes: Welcome to the Caltech Puzzle Hunt! To get everyone up to speed for the main event, we are releasing a set of pre-event puzzles/solutions/notes to introduce some common concepts used in puzzles.

Some takeaways from this puzzle:

- Puzzles will often feature a blob of text (called the *flavor text*) that sets a “theme” for the puzzle (e.g. the theme of this puzzle is recipes), and often adds hints/clues as to what’s important when solving the puzzle (e.g. all the mathematical words). The title usually is also either relevant to the puzzle theme or offers a hint about the solution.
- Answers to puzzles will *always* be a word or phrase, never just a series of random characters. This can help you know when you’re correct, and can help resolve any steps in the puzzle that may be ambiguous. For example, if say the exponentiation step in this puzzle were interpreted as multiplying 2 by 3, your answer would become SUPNR, which doesn’t make sense. This should make it clear that exponentiation is the correct choice! Puzzles often feature small (but reasonable) ambiguities like this.
- A big part of puzzles is to somehow produce letters to form the answer. One very common technique for doing so — featured in this puzzle — is to have a number that *indexes* into a phrase to give a letter (the relevant phrase is usually pretty clear). Indexing is always done with the first letter being index 1, and will always ignore spaces/punctuation, etc.