

The Paradox of Improbable Multiple Choices

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1 Question

What is the answer to the following multiple choice question:

Q: If you pick an answer to this question at random, what is the chance that you will be correct?

(a) 25%

(c) 50%

(b) 60%

(d) 25%

2 Solution

As with any discrete probabilities problem, let us consider the possible outcomes of events, as represented in Figure 1. Of course, this assumes that the probability that each option is correct, which for four options represents a probability of 0.25 that each option is correct. Furthermore, we assume that if option (a) is correct, then option (d) is also correct, and vice-versa, as these options have the same value. Finally, the probability of choosing each option is also 0.25, as the option is selected at random.

With this in mind, we can conclude that all combinations of correct and selected answer have the same probability of $0.25 \times 0.25 = 0.0625$. Considering that there are six outcomes that lead to a correct answer, we can conclude that the probability that the correct option is selected is in fact $6 \times 0.0625 = 0.375$, or 37.5%.

Of course, since this option is not present, the question is in fact impossible – no matter what option you select, you will always be wrong. Therefore, if you encounter this question on a test, you should call your professor out on his *bullshit* and demand that all students are awarded the points reserved for this question.

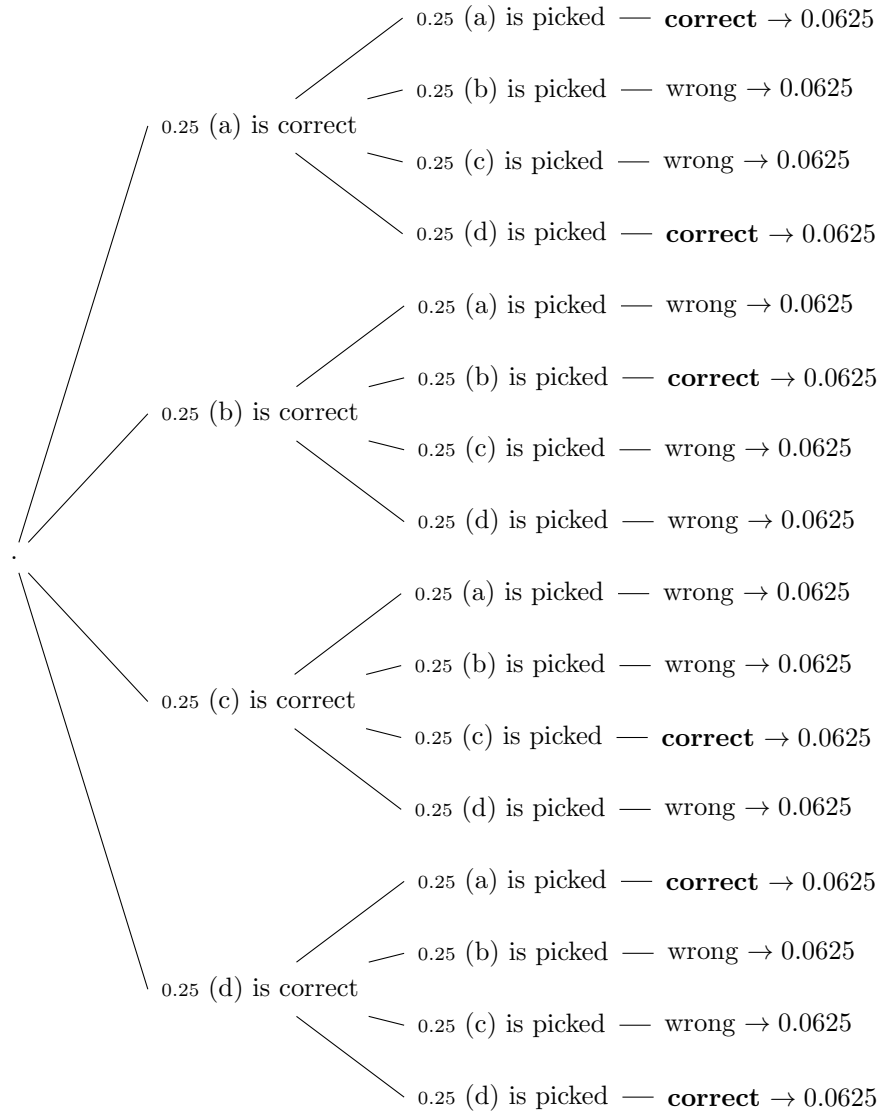


Figure 1: Tree representing the possible outcomes from the question