PRACTICE PROBLEM: BAYES' THEOREM AND TOTAL PROBABILITY

This problem gives practice for using Bayes' Theorem and the Law of Total Probability. The solution is provided on the next page. Please try to solve it before looking at the solution. Since this is a practice problem, you do not have to submit anything.

Your problem set is due in 15 minutes! It's in one of your drawers, but they are messy, and you're not sure which one it's in.

The probability that the problem set is in drawer k is d_k. If drawer k has the problem set and you search there, you have probability p_k of finding it. There are a total of m drawers.

Suppose you search drawer i and do not find the problem set.

- **(a)** Find the probability that the paper is in drawer j, where $j \neq i$.
- **(b)** Find the probability that the paper is in drawer i.