

Initial Probabilities are Important to Correct Choices

What **if Pat tells us** that

probability (Pat rolls one die) = $\frac{1}{4}$ and

probability (Pat rolls two dice) = $\frac{3}{4}$?

In that case, **our guess changes**, as

$$\begin{aligned} & \frac{1}{4} \cdot \text{probability (got a 4 | Pat rolled one die)} \\ & = \frac{1}{4} \cdot \frac{1}{6} = \frac{1}{24} \end{aligned}$$

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$$\begin{aligned} & \frac{3}{4} \cdot \text{probability (got a 4 | Pat rolled two dice)} \\ & = \frac{3}{4} \cdot \frac{1}{12} = \frac{1}{16} \end{aligned}$$