Inspiration.

Example. Which Box?

Box#1   Box#2   Box#3

Q:
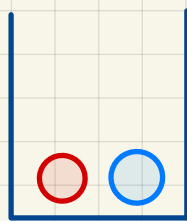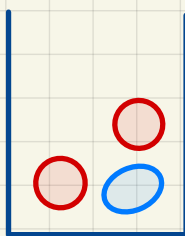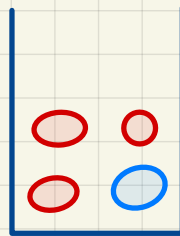
$$\mathbb{P}[\text{Box } i \mid \text{Red}]$$

$$= \frac{\mathbb{P}[\text{Box } i \cap \text{Red}]}{\mathbb{P}[\text{Red}]}$$

for all $i = 1, 2, 3$

$$= \frac{\frac{1}{3} \cdot \frac{i}{i+1}}{\frac{1}{3}\left(\frac{1}{2} + \frac{2}{3} + \frac{3}{4}\right)}$$