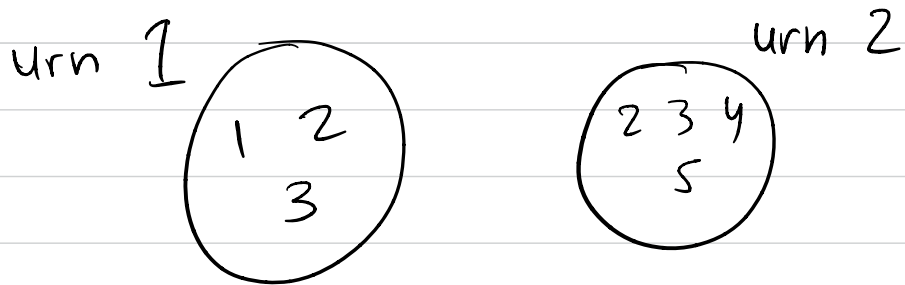


### HW 3

We have two urns. The first urn contains three balls labeled 1, 2, and 3. The second urn contains four balls labeled 2, 3, 4, and 5. We choose one of the urns randomly, so that the probability of choosing the first one is  $1/5$  and the probability of choosing the second one is  $4/5$ . Then we sample one ball uniformly at random from the chosen urn. What is the probability that we picked a ball labeled 2?



Probability of getting 2 is

Get urn 1 and draw a 2 + Get urn 2 and draw a 2

$$\left( \frac{1}{5} \cdot \frac{1}{3} + \frac{4}{5} \cdot \frac{1}{4} \right)$$

$$= \frac{1}{15} + \frac{1}{5} = \frac{4}{15}$$