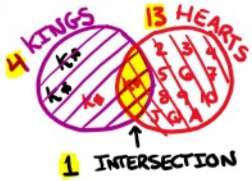
9.7 Probability and Odds II

Wednesday, June 19, 2019 9:58 AM

Pick a card from a deck of 52 cards:

$P(K) = \frac{4}{52} = \frac{1}{13}$ 7.7% $\quad P(H) = \frac{13}{52} = \frac{1}{4}$ 25% $\quad P(KH) = \frac{1}{52}$ 1.9%



$$P(K \text{ OR } H) = P(K) + P(H) - P(KH)$$
$$= \frac{4}{52} + \frac{13}{52} - \frac{1}{52}$$

K♥ K♥

$$= \frac{16}{52} = \boxed{\frac{4}{13}}$$ 30.8%

OR Probability: $P(A \text{ or } B) = P(A) + P(B) - P(AB)$

BOTH A and B

BOTH Black and 4

$$P(B \text{ OR } 4) = P(B) + P(4) - P(B4)$$
$$= \frac{26}{52} + \frac{4}{52} - \frac{2}{52}$$

50% 7.7% 3.8%

$$= \frac{28}{52} = \boxed{\frac{7}{13}}$$ 53.8%

20 total marbles: 4 Blue 6 Red 2 White 8 Green

- Pick one marble: $P(G) = \frac{8}{20} = \frac{2}{5} \quad P(R) = \frac{6}{20} = \frac{3}{10}$

- Pick two marbles **with replacement**: (pick a marble, put it back in jar before you pick another)

$$P(G,R) = P(G) \cdot P(R) = \frac{2}{5} \cdot \frac{3}{10} = \frac{6}{50} = \boxed{\frac{3}{25}}$$

$$P(B,W) = P(B) \cdot P(W) = \frac{4}{20} \cdot \frac{2}{20} = \frac{1}{5} \cdot \frac{1}{10} = \boxed{\frac{1}{50}}$$ 2%

- Pick two marbles **without replacement**: (pick a marble, keep it out of jar and pick another)

$$P(B,W) = P(B) \cdot P(W) = \frac{4}{20} \cdot \frac{2}{19} = \frac{1}{5} \cdot \frac{2}{19} = \boxed{\frac{2}{95}}$$ 2.1%

only 19 marbles in jar because we already picked one out