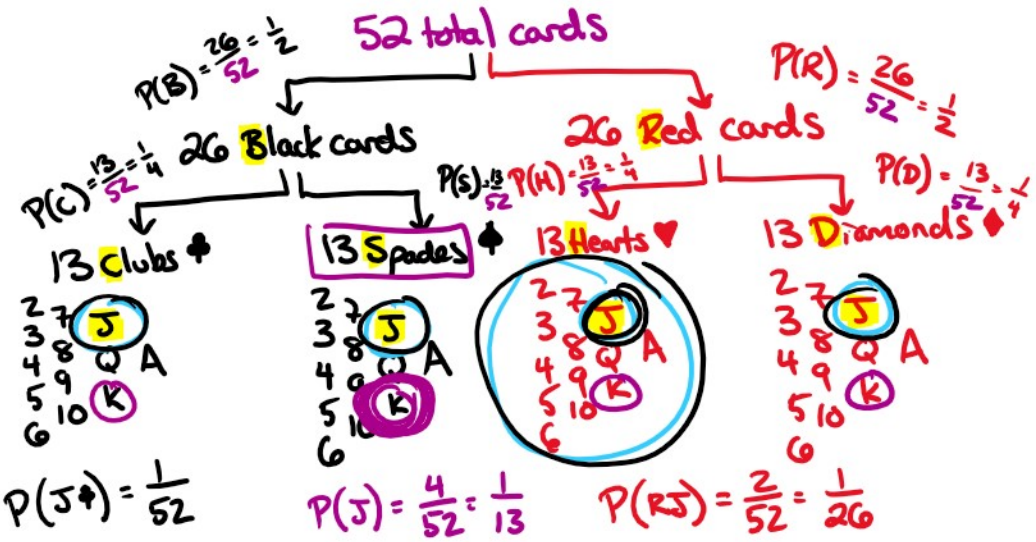
8.8 Compound Probability

Wednesday, June 19, 2019 2:11 PM



mutually exclusive events - two events that have no outcomes in common

Heart Jack
Not mutually exclusive events because there are outcomes in common

Diamond Black
These are mutually exclusive events because it is impossible to pick a Black Diamond

independent events - two events that have no impact on one another

Heart Jack
$P(H) = \frac{1}{4}$ $P(J) = \frac{1}{13}$
Independent Events

Diamond Black
$P(D) = \frac{1}{4}$ $P(B) = \frac{1}{2}$
Not Independent Events

AND Probability

$$P(K\spadesuit) = P(K) \cdot P(\spadesuit)$$
$$= \frac{1}{13} \cdot \frac{1}{4}$$
$$= \frac{1}{52} \quad (2\%)$$

vs.

$$P(K) = \frac{4}{52} = \frac{1}{13}$$
$$P(\spadesuit) = \frac{13}{52} = \frac{1}{4}$$

OR Probability

$$P(K \text{ OR } \spadesuit) = P(K) + P(\spadesuit) - P(K\spadesuit)$$
$$= \frac{4}{52} + \frac{13}{52} - \frac{1}{52}$$
$$= \frac{16}{52} = \boxed{\frac{4}{13}} \quad (30.8\%)$$

ex $P(B \text{ OR } 4) = P(B) + P(4) - P(B4)$

$= \frac{26}{52}^{50\%} + \frac{4}{52}^{7.7\%} - \frac{2}{52}^{3.3\%}$

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

OR Prob. Formula:

$P(A \text{ or } B) = P(A) + P(B) - P(\overset{\text{BOTH}}{\downarrow} AB)$