

TERMS:

Experiment: A procedure or trial that can be repeated and outcomes can be recorded

Ex: Rolling a 6-sided die

Outcome: Possible result of an experiment

1, 2, 3, 4, 5, 6

Sample space (universal set): A list of all possible outcomes

$\Omega = \{1, 2, 3, 4, 5, 6\}$
 → omega

Event: A subset of outcomes

A: rolling an odd number

B: rolling at least a 5

C: rolling a 6

Mutually Exclusive events: Two events that cannot occur at the same time

Only A and C are mutually exclusive

Complimentary events: Mutually exclusive events that together make up the entire sample space

Complementary event to A is denoted A' or \bar{A}

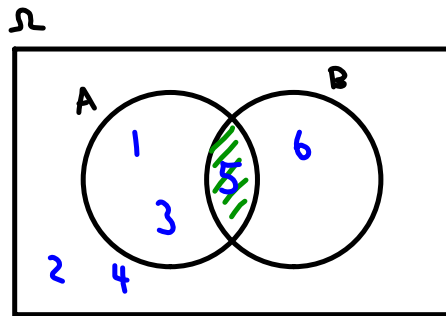
A' : rolling an even number

B' : $\{1, 2, 3, 4\}$

Intersection of events: Two or more events both occurring at the same time.

Notation: $A \cap B = \{5\}$
 ↗ intersection

VENN
DIAGRAM

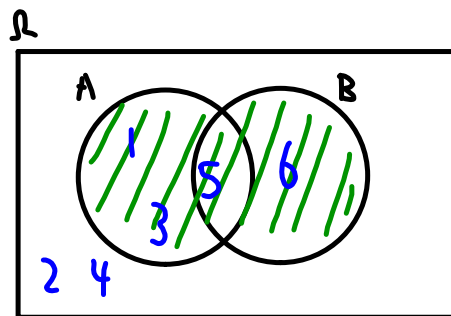


Union of events: Any part of two or more events happening

Notation: $A \cup B = \{1, 3, 5, 6\}$
 ↗ union

Complimentary event:

$(A \cup B)' = \{2, 4\}$



Independent Events: Events that do not depend on each other.

Rolling a 6 and then another 6

Picking a king replacing it a picking a king again
 (with replacement)

Dependent events: Events that do depend on each other

Picking a king, not replacing it and picking a king again
 (without replacement)

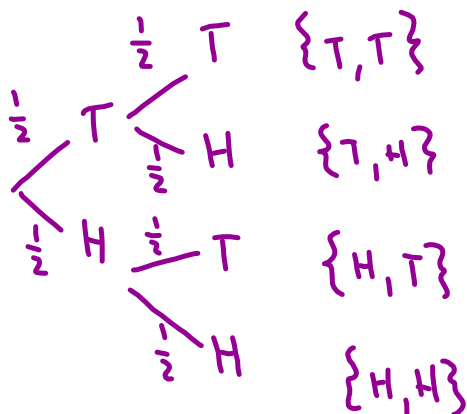
p. 150

$$\#1. a) P(\text{King}) = \frac{4}{52} = \frac{1}{13}$$

$$b) P(\text{spade}) = \frac{13}{52} = \frac{1}{4}$$

$$c) P(\text{K♠}) = \frac{1}{52}$$

#2.



$$P(T, T) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$P(T, H) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$P(H, T) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$P(H, H) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

$$a) P(\text{one tail}) = P(T, H) \text{ or } P(H, T)$$

$$= \frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$