ASQ CRE Prep course

Lesson II. A. 2. a.

Basic Probability Concepts

Probability

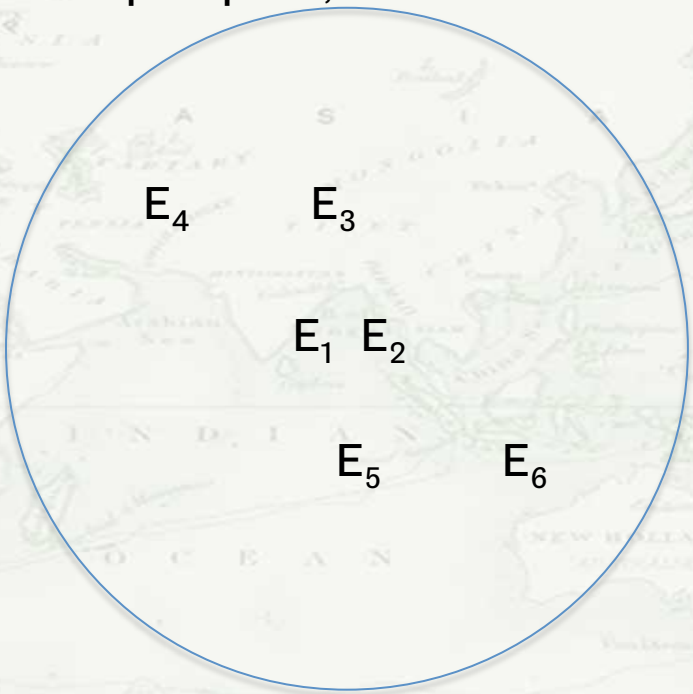
Let's calculate the odds

BASIC PROBABILITY CONCEPTS

Conditions for Probability

- **The probability of an event, E, lies between zero and one**
- **The sum of the probabilities of all possible events in the sample space, S, is one**
- **A fair coin**
- **A fair 6-sided die**
- **A product chance to survive a year**

Union

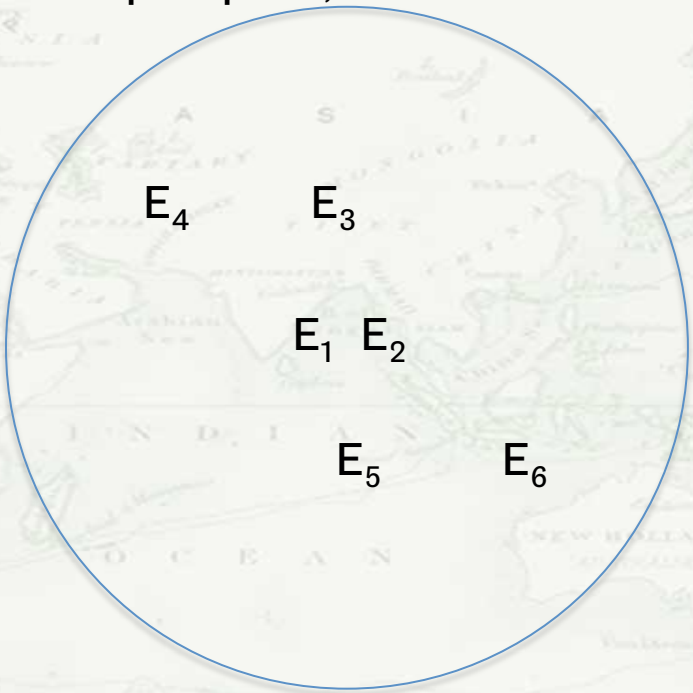


If A and B are two events in a sample space, S, the union of A and B contains all sample points in event A or B or both.

Which Events, E's, are in A ∪ B?

Intersection

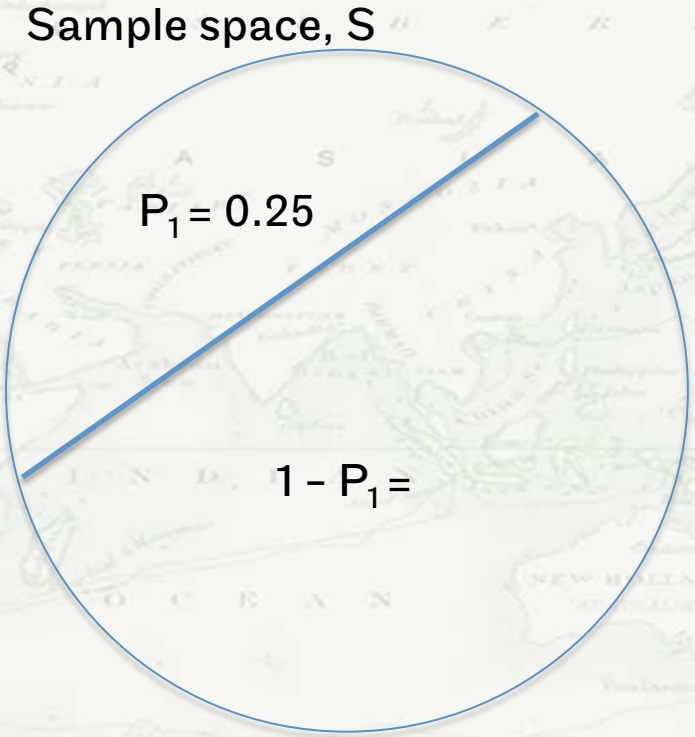
Sample space, S



If A and B are two events in a sample space, S, the intersection of A and B is composed of all sample points that are in both A and B.

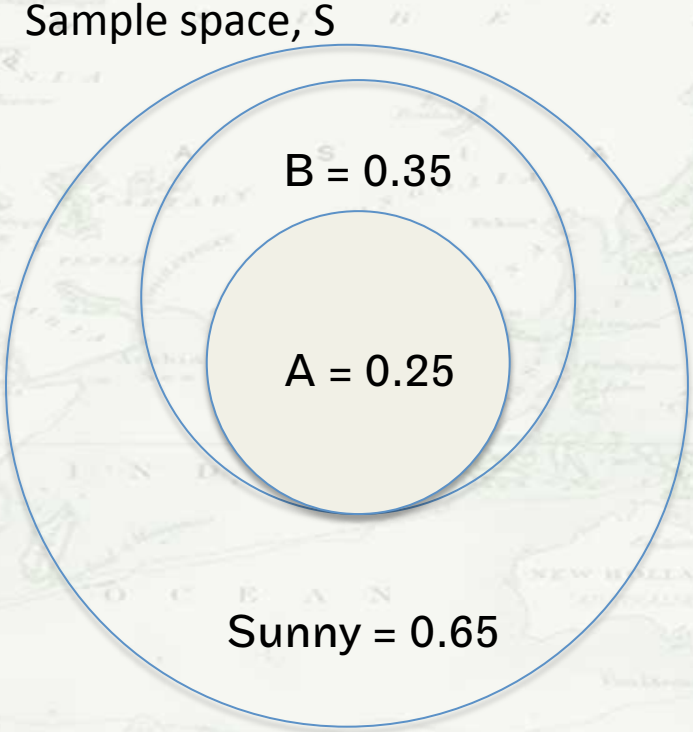
Which Events, E's, are in A ∩ B?

Complement



The complement of an event A is all sample points in the sample space, S, but not in A.

Conditional

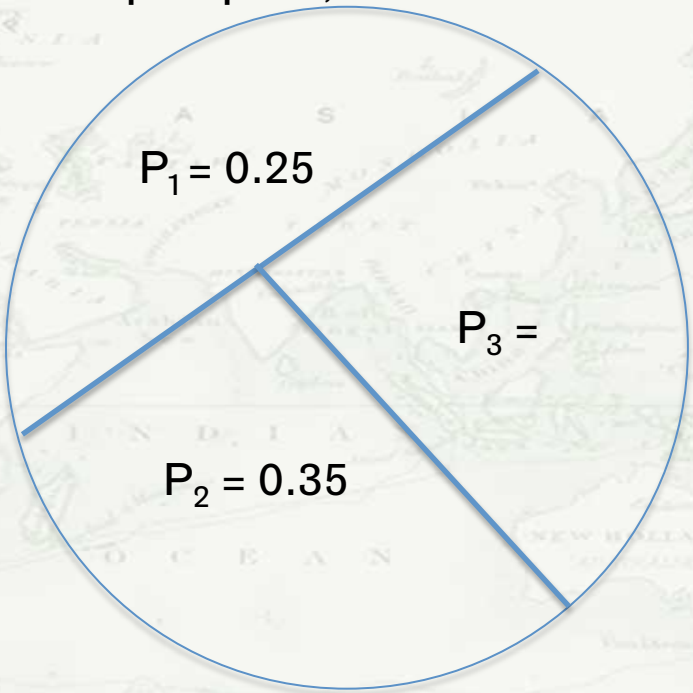


The conditional probability of event A given That B has occurred is:

$$P(A \mid B) = \frac{P(A \cap B)}{P(B)}, P(B) \neq 0$$

Mutually Exclusive

Sample space, S



If two events are mutually exclusive when
They do not share any sample points

Independent

Two events are independent when

$$P(A \cap B) = P(A) \times P(B)$$

$$P(A \mid B) = P(A)$$

Is this coming back to you?

Don’t Panic

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Lesson II. A. 2. b.

Basic Probability Concepts

Laws and Counting