

Section 11.7: Probability

Key Topics: experiment, sample space, probability of an event, the additive rule, mutually exclusive events, complement, relative frequency principle

Any process that terminates in one or more outcomes is _____.

The set of all possible outcomes of a given experiment is the _____.

Probability of an Event

If all of the outcomes in a sample space S are _____, then the _____ of an event E , denoted _____, is the _____ of the number of _____, denoted _____, to the total number of _____, denoted _____. That is:

$$P(E) = \underline{\hspace{2cm}}$$

What is the probability of getting one tail when a coin is tossed three times?

THE ADDITIVE RULE

If E and F are events in a sample space, then

$$P(E \cup F) = \underline{\hspace{2cm}}.$$

Mutually Exclusive Events

Two events are *mutually exclusive* if it is _____ for both to occur _____. That is, E and F are **mutually exclusive** events if _____ contains _____ outcomes. In this case, $P(E \cap F) = 0$ and the _____ is somewhat _____.

MUTUALLY EXCLUSIVE EVENTS

If E and F are any events in a sample space and _____, then

$$P(E \cup F) = \underline{\hspace{2cm}}.$$

What is the probability of getting a sum of 10 or greater when a pair of dice is rolled?

The Complement of an Event

The _____ of an event E is the set of all outcomes in the sample space that are ___ in E . The complement of E is denoted by __. Because every outcome in the sample space is in E or in E' , the event $E \cup E'$ is a _____ event and $P(E \cup E') =$ __. Also, E and E' are mutually exclusive events, so $P(E \cup E') =$ _____. Thus, $P(E) + P(E') =$ __ and $P(E') = 1 - P(E)$.

PROBABILITY OF THE COMPLEMENT

If E is any event and E' is its complement, then

$$P(E') = \underline{\hspace{2cm}}.$$

RELATIVE FREQUENCY PRINCIPLE

If an experiment is performed _____ and an event E _____, then we say that the _____ (or statistical) probability of the event, $P(E)$, is

$$P(E) = \underline{\hspace{2cm}}$$

The table shows the distribution of workers at 3 companies. What is the probability that a randomly selected worker is male and works for Company B?

Company	Male	Female
A	120	150
B	90	75
C	110	110