

Probability

Intersections

An **intersection** is the probability of two independent events BOTH happening. You can think of an intersection as “and”—the intersection of events A and B would be the probability of A and B. To calculate an intersection, multiply the individual probability of the events together. (Note: this only works on independent events. If two events are independent, they do not affect the probability of each other when they occur. You don’t have to worry about this for now—assume all events in this section are independent.)

1. If you flip a coin once...and then again, what is the probability that it lands on heads both times?
2. If I have two dice, what is the probability that I roll a sum of 12?

Unions

Unions are the probability that either event will occur (including the probability for BOTH events to occur). This is like "or"—the probability of A union B is the probability of A or B. To calculate the union, add the individual probabilities and then subtract the intersection to avoid double counting the same outcome.

1. If I have a die, what is the probability that I roll an even number OR a number equal to or less than 3?

Ms. Cook and Mr. Miller are fighting it out in a coin flipping contest!



VS



Name: _____

If Ms. Cook wins on heads and Mr. Miller wins on tails and they play three rounds, what are the chances of Ms. Cook winning?

What if Ms. Cook and Mr. Miller are rolling dice and Ms. Cook wins if the sum of her dice roll is even OR a multiple of three, otherwise Mr. Miller wins. What is the probability of Ms. Cook winning?

Now we have Ms. Cook and Mr. Miller are drawing from a bag of marbles with 9 red marbles, 6 blue marbles, and 5 orange marbles.

Ms. Cook has Mr. Miller draw two marbles, asking him to return the marble to the bag between each draw. What is the probability of Mr. Miller drawing two marbles that are blue?

If they use the same bag of marbles, what is the probability that Ms. Cook pulls out two blue marbles AND a red marble in 3 pulls (after every pull, he puts a marble back)?

A standard deck of cards has 52 cards (excluding jokers) with 13 cards of four suits (spades, hearts, clubs, diamonds). What is the probability of picking a card that is hearts OR an eight?

With the same deck, what is the probability of pulling 3 face cards (J, Q, K) in a row (you do not put the card back after pulling it out)?