

# Solving Complex Probability Problems: Takeaways



by Dataquest Labs, Inc. - All rights reserved © 2020

## Concepts

- The opposite of a set  $E$  is called its **complement**, and it's denoted as  $E^C$ .
- For any random experiment either event  $E$  or  $E^C$  will happen, so the event " $E$  or non- $E$ " is certain and has a probability of 1:

$$P(E \cup E^C) = P(E) + P(E^C) = 1$$

- The **multiplication rule** says that for two events  $E_1$  and  $E_2$ , the probability that both event  $E_1$  **and**  $E_2$  happen can be found by multiplying the probability of  $E_1$  by the probability of  $E_2$ :

$$P(E_1 \cap E_2) = P(E_1) \times P(E_2)$$

- The multiplication rule only works for **independent events**. Events that don't influence each other's probability are called independent events.
- When we sample an element from a group and put the element back, we're **sampling with replacement**.
- When we sample an element from a group but don't put it back, we're **sampling without replacement**.

## Resources

- [A nice tutorial on independent events](#)
- [A brief tutorial that covers types of events](#)



Takeaways by Dataquest Labs, Inc. - All rights reserved © 2020