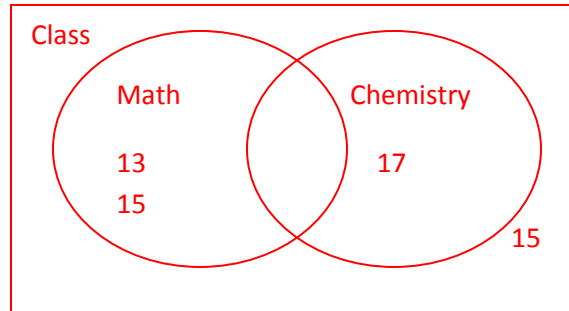


Mutually Exclusive and Inclusive Events

- 2 dice are tossed. What is the probability of obtaining a sum equal to 6? $5/36$
- 2 dice are tossed. What is the probability of obtaining a sum less than 6? $10/36$ or $5/18$
- 2 dice are tossed. What is the probability of obtaining a sum of at least 6? $26/36$ or $13/18$
- Thomas bought a bag of jelly beans that contained 10 red jelly beans, 15 blue jelly beans, and 12 green jelly beans. What is the probability of Thomas reaching into the bag and pulling out a blue or green jelly bean? $27/37$
- A card is chosen at random from a standard deck of cards. What is the probability that the card chosen is a heart or spade? Are these events mutually exclusive? $1/2$; yes
- 3 coins are tossed simultaneously. What is the probability of getting 3 heads or 3 tails? Are these events mutually exclusive? $2/8$ or $1/4$; yes
- In question 6, what is the probability of getting 3 heads *and* 3 tails when tossing the 3 coins simultaneously? 0
- Are randomly choosing a person who is left-handed and randomly choosing a person who is right-handed mutually exclusive events? Explain your answer. Answers will vary; Most will say yes because people are either left handed or right handed, but some may say no because some people are ambidextrous.
- Suppose 2 events are mutually exclusive events. If one of the events is randomly choosing a boy from the freshman class of a high school, what could the other event be? Explain your answer. Randomly choosing a girl from the freshman class
- Consider a sample set as $S = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$. Event A is the multiples of 4, while event B is the multiples of 5. What is the probability that a number chosen at random will be from both A and B ?
 $P(A \text{ and } B) = P(A) \times P(B) = 5/10 \times 2/10 = 1/10$
- For question 10, what is the probability that a number chosen at random will be from either A or B ?
 $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B) = 5/10 + 2/10 - 1/10 = 6/10$ or $3/5$
- A card is chosen at random from a standard deck of cards. What is the probability that the card chosen is a heart or a face card? Are these events mutually inclusive? $13/52 + 12/52 - 3/52 = 22/52$ or $11/26$; yes
- What is the probability of choosing a number from 1 to 10 that is greater than 5 or even? $5/10 + 5/10 - 3/10 = 7/10$
- Are randomly choosing a teacher and randomly choosing a father mutually inclusive events? Explain your answer.
Yes, some teachers are also fathers.

15. Jack is a student in Bluenose High School. He noticed that a lot of the students in his math class were also in his chemistry class. In fact, of the 60 students in his grade, 28 students were in his math class, 32 students were in his chemistry class, and 15 students were in both his math class and his chemistry class. He decided to calculate what the probability was of selecting a student at random who was either in his math class or his chemistry class, but not both. Draw a Venn diagram and help Jack with his calculation.



16. Brenda did a survey of the students in her classes about whether they liked to get a candy bar or a new math pencil as their reward for positive behavior. She asked all 71 students she taught, and 32 said they would like a candy bar, 25 said they wanted a new pencil, and 4 said they wanted both. If Brenda were to select a student at random from her classes, what is the probability that the student chosen would want:
- a candy bar or a pencil? $32/71 + 25/71 - 4/71 = 53/71$
 - neither a candy bar nor a pencil? $18/71$

Source: <http://www.ck12.org/book/CK-12-Basic-Probability-and-Statistics-Concepts---A-Full-Course/r11/>