

1.

Write down the formulas given in class for: $P(A \cup B) =$ $P(A \cap B) =$	If A and B are mutually exclusive: $P(A \cap B) =$ If A and B are independent: $P(A B) =$
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2. 42% of adults are Republican, 18% of adults support proposition B, and 53% of adults are Republican or support proposition B. If you randomly select an adult, what is the probability they are Republican and support proposition B?

3. You are required to buy a single insurance policy for your car. The probability you choose to insure with Geico is 0.32. The probability you choose to insure with Farmers is 0.39. What is the probability you choose to insure with Geico or Farmers?

4. You flip a coin once and toss a die once. The probability you get a heads on the coin is 0.5. The probability you roll a 3 on the die is $1/6$. What is the probability you get a heads on the coin or a 3 on the die?

5. The probability you have breakfast is 0.7. The probability you have lunch is 0.2. However, if you don't have breakfast, the probability you have lunch is 0.4. What is the probability you don't have breakfast but do have lunch?

6. The probability an adult owns more than 1 vehicle is 0.26. The probability an adult makes more than \$60,000 a year is 0.12. If an adult makes more than \$60,000 a year, the probability they own more than 1 vehicle is 0.35. What is the probability an adult owns more than 1 vehicle, or makes more than \$60,000 a year?

Use the following for questions 7 through 12

14% of adults own a desktop computer and a laptop

38% own a laptop but not a desktop

18% own a desktop but not a laptop

Draw a Venn diagram

7. What is the probability an adult owns a desktop or a laptop?

8. If an adult owns a desktop, what is the probability they own a laptop?

9. If an adult owns a laptop, what is the probability they own a desktop?

10. What is the probability an adult owns a laptop, if they do not own a desktop?

11. If an adult does not own a laptop, what is the probability they own a desktop?

12. Are owning a laptop and owning a desktop independent events?

Use the following to answer questions 13 through 15

51% of the population is male. Of males, 32% major in a STEM field. Of females, 15% major in a STEM field.

Draw a tree diagram

13. If someone is majoring in a STEM field, what is the probability they are male?

14. If someone is majoring in a STEM field, what is the probability they are female?

15. If someone is not majoring in a STEM field, what is the probability they are male?

16. The probability an adult will develop alzheimer's is 0.04. The probability an adult drinks coffee is 0.65. The probability an adult will develop alzheimer's if they do not drink coffee is 0.08. What is the probability an adult develops alzheimer's and does not drink coffee?

17. The probability an adult is a smoker is 0.14. The probability an adult will develop heart disease is 0.21. If an adult is a smoker, the probability they will develop heart disease is 0.38. What is the probability an adult is a smoker or develops heart disease?

18. I have won an airline ticket good for travel to one and only one location. The probability I use it to travel to Albania is 0.39. The probability I use it to travel to Brazil is 0.27. What is the probability I use it to travel to Albania or Brazil?

19. The probability I watch a movie this evening is 0.24. The probability I read this evening is 0.08. The probability I watch a movie or read this evening is 0.29. What is the probability I watch a movie and read this evening?

20. The probability Jane goes to the movies tomorrow is 0.26. The probability it rains in Zimbabwe tomorrow is 0.18. The probability Jane goes to the movies tomorrow is not affected by whether or not it rains in Zimbabwe tomorrow. What is the probability Jane goes to the movies tomorrow, or it rains in Zimbabwe tomorrow?

Use the following for questions 21 through 23

18% of programmers code in Lisp and do not like green tea
12% code in Lisp, and do like green tea
28% don't code in Lisp, but do like green tea

Draw a Venn diagram

21. What is the probability a programmer does not like green tea, if you know that they code in Lisp?

22. Given that a programmer does not like green tea, what is the probability they don't code in Lisp?

23. Are coding in Lisp and liking green tea independent events?