AP Stat Chapter 5 – Probability Name: Section 5.2 Practice

1. Last Saturday at Pasquale’s Pizzas and Wings, 60 customers were served over the course of the evening. Fifty-two customers ordered pizza and 16 ordered buffalo wings. Twelve of these customers ordered both pizza and wings. Suppose we select a customer from last Saturday at random.
   1. Fill in a Venn diagram so that it describes the chance process involved here. Let P = the event “ordered pizza” and W = the event “ordered wings.”
   2. What is the probability that a randomly-chosen customer did not order wings or pizza? Justify your answer with appropriate calculations.
2. The table below gives the counts (in thousands) of earned degrees in the United States in a recent year, classified by level and by the gender of the degree recipient.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Bachelor’s | Master’s | Professional | Doctoral | Total |
| Female | 616 | 194 | 30 | 16 | 856 |
| Male | 529 | 171 | 44 | 26 | 770 |
| Total | 1145 | 365 | 74 | 42 | 1626 |

Suppose one degree recipient from this group is selected randomly. Answer the following questions, showing appropriate work or explanations.

* 1. List two mutually exclusive events for this chance process.
  2. What is the probability that the person selected earned a Master’s degree?
  3. What is the probability that the person selected earned a Professional or Doctoral degree?
  4. What is the probability that the person selected is female or earned a Master’s degree?

1. Draw and label each of the following on a Venn Diagram:
   1. (A∩B) b) (Ac ∩ B) c) (A ∩ Bc )
2. In a recent survey of 100 10-year olds, the following information was obtained:

53 liked McDonalds 12 liked both McDonalds and Burger King

24 liked Burger King 23 liked both McDonalds and Wendy’s

42 liked Wendy’s 4 liked only Burger King

6 liked all three

* 1. Draw a Venn diagram illustrating this information.
  2. How many 10-year olds don’t like any of these three?
  3. What percentage of these 10-year olds like Burger King and Wendy’s?
  4. If one of these 10-year olds likes Wendy’s, what is the probability that he likes Burger King?

1. Roll a die. Let S = {1, 2, 3, 4, 5, 6 }. Let event A={ 1, 2, 3, 4 } and event B= { 2, 3, 4, 5, 6 }. Find the following:
   1. Members of the set A ∩ B e. Members of the set Ac ∩B
   2. P ( A∩B) f. P ( A c ∩ B)
   3. Members of the set A ∩Bc g. Members of the set A c ∩Bc
   4. P ( A ∩ Bc ) h. P ( A c ∩Bc )

1. Roll two dice and observe the sum. Define the events as follows: A = {the value is even} B = {the value is odd} C = {the value is less than 6} D = {the value is greater than or equal to 6}
   1. Write the sample space for the observed sum.
   2. Are events A and C mutually exclusive (disjoint)?
   3. Calculate P () d. Calculate P ()
2. Three friends are trying to decide who gets the last doughnut. They decide on the following scheme: each will flip a fair coin and whoever gets the unique result will win the doughnut (if the result is HTT then the first wins; if the result is HTH then the second wins). If all come out the same, they will feed the doughnut to the birds.
   1. What are the probabilities of each one winning? b. What is the probability that the birds get it?
3. Suppose the probability that a construction company will be awarded a certain contract is 0.25, the probability that it will be awarded a second contract is 0.21, and the probability that it will get both contracts is 0.13.
   1. Draw the Venn diagram that illustrates this situation.
   2. What is the probability that only the first contract is rewarded?
   3. What is the provability that the first or the second contract is rewarded?
   4. What is the probability that the company will win at least one of the two contracts?
4. Roll a die twice. Observe the numbers landed on.
   1. What is the probability of observing two 5’s? b. What is the probability of observing at least one 5?
5. Let P(A) = 0.5, P(B) = 0.7, P(A and B) = 0.4, find the probability that
   1. Either A or B will occur b. Neither A nor B will occur
6. Common sources of caffeine are coffee, tea, and cola drinks. Suppose that 55% of adults drink coffee, 25% of adults drink tea, and 45% of adults drink cola. Also suppose that 15% drink both coffee and tea, 5% drink all three beverages, 25% drink both coffee and cola, and 5% drink only tea. Draw a Venn diagram marked with this information. Use it along with the addition rules to answer the following questions.
   1. What percent of adults drink only cola? B. What percent drink none of these beverages?
7. A check of dorm rooms on a large college campus revealed that 38% had refrigerators, 52% had TVs, and 21% had both a TV and a refrigerator. What’s the probability that a randomly selected dorm room has
   1. a TV but no refrigerator?
   2. a TV or a refrigerator, but not both?
   3. neither a TV nor a refrigerator?
8. Employment data at a large company reveal that 72% of the workers are married, that 44% are college graduates, and that half of the college grads are married. What’s the probability that a randomly chosen worker
   1. is neither married nor a college graduate?
   2. Is married but not a college graduate?
   3. Is married or a college graduate?