Disclaimer

Chapter 5 Homework

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1. Define probability.
2. Define event.
3. Define sample space.
4. True or False. Probabilities of all outcomes in a sample space sum to −1.
5. True or False. Probabilities range in value from 0 to 1, inclusive. Zero denotes the event will not occur. One denotes the event will definitely occur.
6. True or False. Probabilities can be greater than 1.
7. A 120 question multiple-choice test has 4 options for each question. If answers are randomly selected, how many correct answers are expected?
8. A 75 question multiple-choice test has 5 options for each question. If answers are randomly selected, how many correct answers are expected?
9. There are 52 cards in a deck. If one card is selected at random, what is the probability of selecting a queen from a deck of cards?
10. There are 52 cards in a deck. If one card is selected at random, what is the probability of not selecting a club from a deck of cards?
11. A fruit basket has 3 oranges, 5 peaches, 1 pineapple and 6 apples. If one fruit is selected at random, what is the probability that the fruit is a peach?
12. Define mutually exclusive events.
13. Define non-mutually exclusive events.
14. True or False. Mutually exclusive events are also referred to as disjoint events.
15. If P(A) = 0.31 and P(B) = 0.24, what is P(A or B) considering the two events are mutually exclusive?
16. If P(A) = 0.76 and P(B) = 0.05, what is P(A or B) considering the two events are mutually exclusive?
17. At a carnival, 30% of patrons ride the Ferris wheel. 55% of patrons ride the roller coaster. 45% of patrons ride the Ferris wheel and roller coaster. If a patron is

selected at random, what is the probability the patron rides the Ferris wheel or the roller coaster?

18. At a local high school, 10% of male students play football. 7% of male students play basketball. 1% of male students play football and basketball. If one male student is chosen at random, what is the probability he plays football or basketball?
19. There are 52 cards in a deck. If one card is selected at random, what is the probability of selecting a jack or a spade from a deck of cards?
20. There are 52 cards in a deck. If one card is selected at random, what is the probability of selecting a queen or a red card from a deck of cards?
21. True or False. To determine the probability of multiple events that occur at the same time, in succession, or in sequence, researchers use the multiplication rule of probability.
22. Define independent events.
23. Define dependent events.
24. If P(A) = 0.17 and P(B) = 0.91, what is P(A and B) considering the two events are independent?
25. If P(A) = 0.48 and P(B) = 0.73, what is P(A and B) considering the two events are independent?
26. In a sample of 10 people, 2 people are attorneys, 3 people are police officers, 3 people are firefighters and 2 people are pilots. Two people are randomly selected with replacement. What is the probability that both are firefighters? Suppose two people are randomly selected without replacement. What is the probability that both are firefighters?
27. An assorted box of candy has 5 caramels, 6 chocolates and 7 chocolate covered peanuts. If 2 pieces of candy are randomly selected with replacement, what is the probability that both pieces are caramels? Suppose 2 pieces of candy are randomly selected without replacement. What is the probability that both pieces are caramels?

28. True or False. Mutually exclusive events are the same as independent events.
29. In a classroom, 11% of students speak German. 4% of students speak French and German. If a student is selected at random, what is the probability that the student speaks French given that he/she speaks German?
30. If a manager is randomly selected, what is the probability that the manager was not rated good?

	Poor	**Fair**	**Good**
Male	16	44	51
Female	25	72	56

31. If a student is selected at random, what is the probability that the student is not majoring in Music?

	Music	**History**	**Statistics**	**Education**
Freshman	21	15	40	64
Sophomore	16	31	26	55
Junior	9	21	44	34
Senior	17	20	33	42

32. List the 4 counting rules.
33. True or False. Counting rules can be used to determine the number of outcomes in a sample space.

Answers

1. Probability: the likelihood of an event occurring.
2. Event: a subset of the sample space.
3. Sample Space: all possible outcomes of an experiment.
4. False
5. True
6. False
7. 30
8. 15
9. 0.077
10. 0.75
11. 0.333
12. Mutually exclusive events: events that do not have any outcomes in common.
13. Non-mutually exclusive events: events that do have outcomes in common.
14. True
15. 0.55
16. 0.81
17. 0.40
18. 0.16
19. 0.308
20. 0.538
21. True
22. Independent events: events in which the probability of the second event is not affected by the probability of the first event.
23. Dependent events: events in which the probability of the second event is affected by the probability of the first event.
24. 0.1547
25. 0.3504
26. 0.09; 0.067
27. 0.077; 0.065
28. False
29. 0.364
30. 0.595

31. 0.871
32. Fundamental counting rule, factorial rule, permutations rule and combinations rule
33. True