**Unit 6: Probability STUDY GUIDE**

**Short Answer**

 1. William reviewed the recent records for dog license applications. He counted the number of applications for different types of dogs. Below is the information that William collected.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dog** | Collie | Mixed Breed | Mastiff | Dalmation | All Other |
| **Number of licenses** | 31 | 16 | 27 | 33 | 32 |

Estimate the probability that the next dog license application will be for a collie.

 2. While waiting for the school bus, Lynda records the colors of all vehicles passing through the intersection. Below is the information that Lynda collected.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Car color** | Red | Gray | White | Silver |
| **Number of cars** | 21 | 10 | 11 | 16 |

Estimate the probability that the next car through the intersection will be red.

 3. Miguel is on the school archery team. The target has a center bull’s-eye and two rings around the bull’s-eye. The table below gives the probabilities of each outcome. What is the probability that Miguel will get her next arrow in the inner or outer ring? Express your answer as a decimal.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Outcome** | Bull’s-eye | Inner ring | Outer ring | Miss |
| **Probability** | 0.097 | 0.141 | 0.306 | 0.456 |

 4. The gym teacher records free-throw results for 5 students in a gym class. The results are shown in the table below. Suppose the teacher lets Mitsugu and Nestor take one more free throw each. Compare the probability that Mitsugu will make the shot to the probability that Nestor will make the shot.

|  |  |  |
| --- | --- | --- |
| **Student** | **Number of Free Throws Made** | **Number of Free Throws Attempted** |
| Lynda | 22 | 51 |
| Akira | 13 | 63 |
| William | 20 | 61 |
| Mitsugu | 22 | 45 |
| Nestor | 29 | 57 |

Tien plays on the school basketball team. The team’s results are shown in the table below. Tien’s results for each game are also shown in the table.

|  |  |  |
| --- | --- | --- |
| **Game** | **Team’s Total Points** | **Tien’s Points** |
| 1 | 102 | 11 |
| 2 | 75 | 14 |
| 3 | 87 | 14 |
| 4 | 96 | 20 |
| 5 | 85 | 11 |
| 6 | 70 | 18 |
| 7 | 70 | 7 |

*Use these results to answer the questions 5 and 6 below.*

 5. What is the experimental probability that Tien will score 10 or more points in the next game?

 6. What is the experimental probability that the basketball team will score less than 78 points in the next game?

 7. What is the probability that a point chosen at random on the grid will lie in the unshaded region?

 8. Pedro plays on the school baseball team. In the last 11 games, Pedro was at bat 38 times. While at bat, Pedro got 13 hits and struck out 25 times. What is the experimental probability that Pedro will get a hit during his next time at bat?

***For each case described below, determine how likely the event is to occur. Use the terms certain, likely, equally likely, less likely, or impossible.***

 9. According to the weather forecast, there is a 20% chance of rain today. How likely is it that it will rain?

 10. All the students in the school band showed up for practice today. How likely is it that all the clarinet players are present for band practice?

 11. You roll two fair number cubes. What is the likelihood you will roll a total of 14?

 12. A deck of 52 cards is spread out face down on a table. You randomly choose one card. What is the likelihood you will choose the three of hearts?

 13. Suppose you flip a coin. What is the likelihood the coin will land heads up?

 14. Three parts are available in the school play. Four students try out for these three parts. The director of the play fills all the parts. How likely is it that any one student who tried out will be in the school play?

 15. How likely is it that the sun will rise tomorrow morning?

 16. A bag contains 10 marbles: 5 red, 3 blue, and 2 yellow. If you reach into the bag and choose one marble at random, how likely are you to choose a green marble?

 17. Your teacher divides the class into two groups of the same size by picking names at random from the class. What is the likelihood you will be put in group 1?

 18. During the summer, your friend has swimming lessons every Tuesday and Thursday morning at the neighborhood pool. How likely is it that you’ll see your friend at the pool on Tuesday morning during the summer?

19. **Rachelle is in a science class that has surprise quizzes given at random during the year. In the last 33 days of science class, Rachelle had 2 surprise quizzes.**

 What is the experimental probability Rachelle will have a science quiz tomorrow?

*An experiment consists of spinning the spinner shown below. All outcomes are equally likely.*

 20. What is the probability that the spinner will land on 1?

 21. What is the probability that the spinner will land on an odd number?

 22. A spinner is divided into three sections; red, blue, and green. The red section is of the area of the spinner. The blue section is of the area of the spinner. Give the probability for each outcome.

 23. Yang has two spinners that are shown below. If Yang spins both of the spinners, what is the size of the sample space?

24. A carnival has a duck-pond booth where you win a small, medium, or large prize if you select a specially marked plastic duck as the ducks float by. There are a total of 78 plastic ducks floating in the pond. There are 3 ducks marked as large-prize winners, 15 ducks marked as medium-prize winners, and 26 ducks marked as small-prize winners.

 What is the theoretical probability, expressed as a decimal, of winning a small prize at the duck pond?

 25. A gum ball machine has 8 purple gum balls, 12 blue gum balls, 9 yellow gum balls, and 10 pink gum balls. You put a coin into the machine and get one gum ball. What is the theoretical probability of receiving a pink gum ball?

 26. Find the probability that a point chosen at random will lie in the shaded area.

 27. A soda company gives prizes to anyone finding specially marked caps on its soda bottles. You and your friends buy 53 bottles of soda. You find 4 of the bottles have a winning cap. What is the experimental probability of winning a prize in the contest?

 28. Sarah flips a coin 50 times, and it lands on heads 20 times. What is the relative frequency of it landing on tails? (written as a percent)

 29. At dart is thrown at the board below. What is the probability of hitting the white region?

 30. John makes a chart of lunch choices. How many lunch combinations are there if he does not eat tuna or veggies?

 31. At dart is thrown at the board below. What is the probability of hitting the shaded region?

 32. A jar has green, blue, and yellow jelly beans. If the probability of getting a blue jelly bean is and the probability of getting a green jelly bean is . What is the probability of getting a yellow jelly bean?

 33. Sally is getting dressed for her school’s crazy color day. She has orange, green, red, and white shirts and yellow, blue, and purple pants. How many combinations of one shirt and one pant does she have?

**Unit 11: Probability STUDY GUIDE**

**Answer Section**

**SHORT ANSWER**

 1. 22.302%

 2. 36.207%

 3. 0.447

 4. Mitsugu is less likely than Nestor to make the shot.

 5.

 6.

 7.

 8.

 9. Unlikely

 10. Certain

 11. Impossible

 12. Unlikely

 13. As likely as not

 14. Likely

 15. Certain

 16. Impossible

 17. As likely as not

 18. Likely

 19.

 20.

 21.

 22. Outcome: Red Blue Green

Probability:

 23. 15

 24. 0.333

 25. 0.256

 26. 0.32

 27.

 28. 60%

 29. 64%

 30. 9

 31. 91%

 32.

 33. 12