NAME: _____ Period: _____ Test Date: _____

Two-Three Dimensional Figures; Statistics, Probability& Simulations; and Probability: Study Guide

Short Answer

1. Determine which sampling method will better represent the entire population. Justify your answer.

Sampling Method	Results of Survey
Tom surveys 40 moviegoers by randomly choosing their names.	60% like the movie.
Kim surveys 100 moviegoers that entered the movie theater in the first hour.	80% like the movie.

2. Determine whether the sample may be biased. Explain.
   A TV station wants to get the opinions of viewers on the look of a new game-show set. The station's staff calls random people in the phone book.

3. A high school has 1,500 students. In a random sample of 50 students, 32 own one or more pets. Predict the number of students at the high school who own one or more pets.

4. A small town has 2,500 residents. In a random sample of 125 residents, 2 have the flu. Predict the number of residents of the town who have the flu.

5. Showton Middle School has 840 students. Teresa surveys a random sample of 60 students and finds that 8 of them have more than 3 siblings. How many students at the school are likely to have more than 3 siblings?

6. The Springfield School band has 515 sweatshirts to sell at a fund-raiser. A survey shows that 3 out of 9 students in the school would purchase a sweatshirt. If there are 1,440 students in the school, predict how many students would buy a sweatshirt. Will the band probably sell all the sweatshirts?

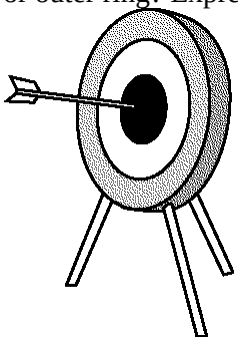
7. The table shows the number of students who entered the science fair in the last 7 years. Compare the mean and median of the data sets with and without the outlier.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
11	5	15	10	40	12	7

8. Determine whether the event is impossible, unlikely, as likely as not, likely, or certain.
The sun will be very hot an hour from now.

9. Ms. Peterson teaches a social studies class with 27 students. Ms. Peterson divides the class into 2 equal-sized groups alphabetically by last name to work on final presentations. What is the likelihood that Masami Asato and Kelly Plante will be in the same group?

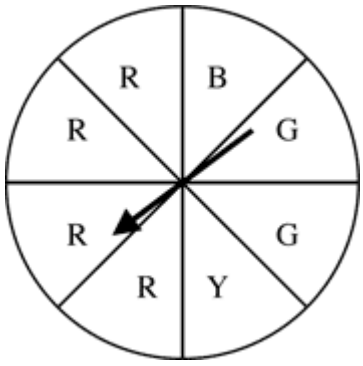
10. Leon is on the school archery team. The target has a center bull's-eye and two rings around the bull's-eye. The table gives the probabilities of each outcome. What is the probability that Leon will get the next arrow in the inner or outer ring? Express your answer as a decimal.



Outcome	Bull's-eye	Inner ring	Outer ring	Miss
Probability	0.119	0.257	0.385	0.239

11. There are 4 red cards and 8 black cards in a bag. How likely is it that you will randomly draw a blue card?

12. The spinner below is divided into equal parts. If you spin the spinner, what is the probability of the pointer landing on G?



13. While waiting for the school bus, William records the colors of all cars passing through an intersection. The table shows the results. Estimate the probability that the next car through the intersection will be green. Express your answer as a percent. If necessary, round your answer to the nearest tenth.

Car Color	Green	Red	Blue	White
Number of Cars	6	6	9	18

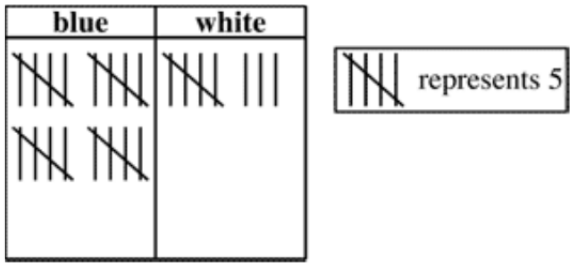
14. Keiko reviewed the recent records for dog license applications. He counted the number of applications for different types of dogs. The table shows the information that Keiko collected. Estimate the probability that the next dog license application will be for a Bernese. Express your answer as a percent. If necessary, round your answer to the nearest tenth.

Dog	Bernese	Husky	Chihuahua	Poodle	Other
Number of Licenses	17	21	18	15	46

15. If you roll a number cube 54 times, how many times do you expect to roll a 4?

16. At the Rockville Middle School carnival, 8 of the first 120 people who played the ring toss game won the first prize, 16 won the second prize, and 24 won the third prize. What is the experimental probability of not winning the first, second, or third prize?

17. A bag holds 5 blue marbles and 2 white marbles. Rusty takes a marble out of the bag, records the color, then replaces the marble in the bag. He does this 28 times and records his results below.



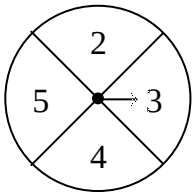
Are the outcomes for the experiment equally likely? What is the experimental probability that a blue marble will be chosen from the bag? Write your result as a decimal. Round to the nearest hundredth when necessary.

18. Find the probability of rolling a 6 on the first number cube and rolling a 4 on the second number cube. Assume the number cubes are fair and have six sides. Express your answer as a fraction in simplest form.

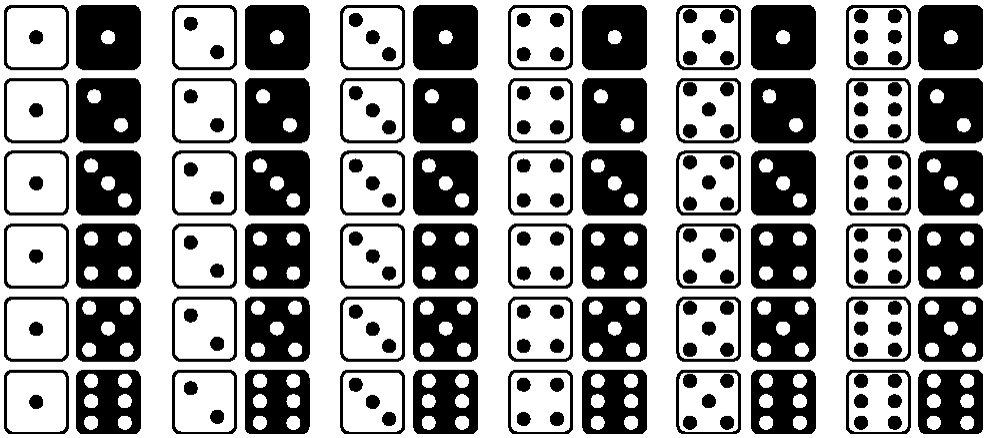

Cube 1


Cube 2

19. Greg spins the spinner twice. Find the probability that the spinner will land on an even number both times. Express your answer as a fraction in simplest form.



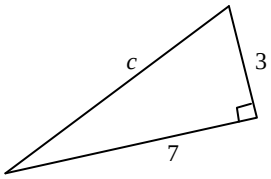
20. An experiment consists of rolling two fair number cubes. The diagram shows the sample space of all equally likely outcomes. What is the probability of rolling two 1's? Express your answer as a fraction in simplest form.



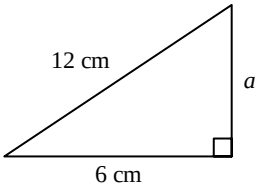
21. The legs of a right triangle are represented by a and b, and the hypotenuse of the right triangle is represented by c. Which equation is *not* equivalent to the Pythagorean Theorem?

22. State the converse of the Pythagorean Theorem.

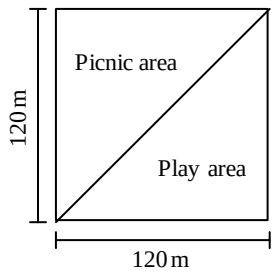
23. Find the length of the hypotenuse. Round your answer to the nearest hundredth.



24. Find the length of the unknown side. Round your answer to the nearest tenth.

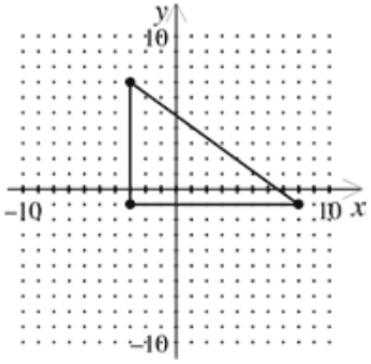


25. A community is building a square park with sides that measure 120 meters. To separate the picnic area from the play area, the park is split by a diagonal line from opposite corners. Determine the approximate length of the diagonal line that splits the square. If necessary, round your answer to the nearest meter.



26. The vertices of a square are $(-5,-4)$, $(-2,-8)$, $(1,-4)$, and $(-2,0)$. What is the area of the square?

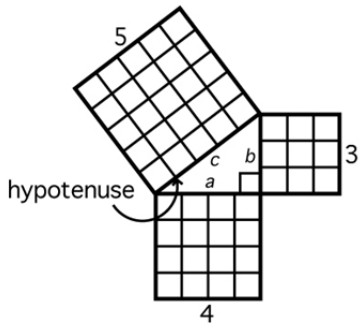
27. Find the length of the hypotenuse of the triangle.



Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Davina uses a diagram to demonstrate the Pythagorean Theorem.

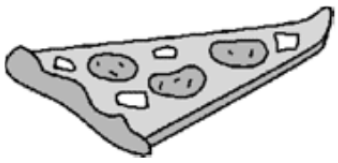


How are the squares related to the sides of the triangle?

a. The area of each square is equal to the square of the length of the side to which it is adjacent.
b. The area of each square is equal to the length of the side to which it is adjacent.
c. The sum of the areas of the squares is equal to the square of the perimeter of the triangle.
d. The perimeter of each square is twice the length of the side of the triangle squared.

Numeric Response

1. A comparison of the prices of various sizes of pizza at 3 stores in one city was made. The results are shown in the table.



	Medium	Large	Family
Store A	$8.95	$11.15	$13.55
Store B	$5.75	$7.00	$8.25
Store C	$12.20	$16.10	$19.10

In dollars, how much greater is the mean of the prices at the most expensive store than the mean at the least expensive store?

Explain Your Thinking

1. The data below shows the heights of several buildings in two cities.

Midtown Building Heights (feet)	Parkerville Building Heights (feet)
45	65
30	50
40	70
25	80
55	55
20	45

Part A: Find the mean and mean absolute deviation of each data set.

Part B: Construct a dot plot for each data set using the same number line.

Part C: How are the means and mean absolute deviations represented in the dot plots?

Part D: How does the dot plot show the overlap between the data sets?

2. ***Part A:***
The average adult human has about 25,000,000,000 red blood cells and about 34,000,000 white blood cells. What is each of these numbers in scientific notation?

Part B:
How many more red blood cells does the average adult human have than white blood cells? Express your answer in scientific notation rounded to two decimal places and explain your answer.

Two-Three Dimensional Figures; Statistics, Probability& Simulations; and Probability STUDY GUIDE Answer Section

SHORT ANSWER

1. Tom's method better represents the entire population because he uses a random sample.
2. The sample is biased. Some people who watch the show are not listed in the phone book.
3. 960
4. 40
5. 112
6. about 480; No
7. The mean and median are both greater with the outlier included.
8. certain
9. unlikely
10. 0.642
11. impossible
12. $\frac{1}{4}$
13. 15.4%
14. 14.5%
15. 9 times
16. 0.60
17. No. The experimental probability that a blue marble will be chosen from the bag is 0.71.
18. $\frac{1}{36}$
19. $\frac{1}{4}$
20. $\frac{1}{36}$
21. $c = \sqrt{b^2 - a^2}$
22. If the sum of the squares of the lengths of the legs of a triangle is equal to the square of the length of the hypotenuse, then the triangle is a right triangle.
23. 7.62
24. 10.4 cm
25. 170 meters
26. 25 square units
27. 13.6

MULTIPLE CHOICE

1. A

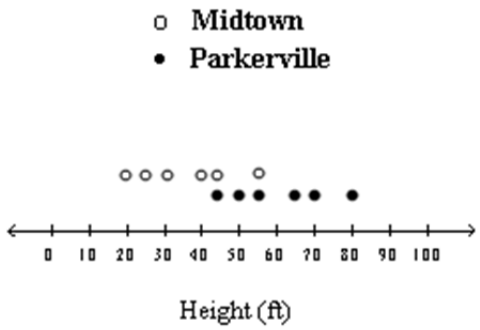
NUMERIC RESPONSE

1. 8.80

ESSAY

1. ***Part A:***
   Midtown: mean ≈ 35.8; mean absolute deviation ≈ 10.8
   Parkerville: mean ≈ 60.8; mean absolute deviation ≈ 10.8

   Part B:



Part C: Midtown's mean is less than Parkerville's mean, so the dot plot for Midtown is left of the dot plot for Parkerville. The mean absolute deviations are the same, so the dots for both cities are spread out equally.

Part D: The overlap is represented by the data points located above the same numbers on the number line.

2. ***Part A:*** 2.5×10^{10}; 3.4×10^{7}

   Part B: 2.5×10^{10}; The difference of the two numbers in standard notation is $24,996,000,000 = 2.4996 \times 10^{10}$. When this number is rounded to two decimal places, the answer is 2.5×10^{10}.