

Probability Practice Questions

YOU MAY USE A CALCULATOR ON ALL PROBLEMS IN THIS PRACTICE SET.

1. A certain hospital currently contains 319 patients, 25 nurses, 8 doctors, and 48 visiting family members. If a person is picked at random from every person currently in the hospital, which of the following choices is closest to the probability that they are a nurse?

- (A) .063
- (B) .066
- (C) .25
- (D) 16

Genre	Number of Respondents
Science Fiction	264
Fantasy	423
Mystery	637
Non-Fiction	168
Sports	142
Unsure	205

Type of Snack	Number of Children
Popcorn	7
Licorice	1
Ice Cream	12
Chips	18
Sandwich	3
Carrots	6
No Response	3

2. The table above shows the results of a survey of a group of 50 children who were asked their favorite type of snack. If a child is picked at random from this group, which of the following is closest to the probability that their favorite snack is either popcorn or carrots?

- (A) .12
- (B) .14
- (C) .26
- (D) .35

3. The table above shows the results of a survey of 1,875 readers and their favorite genre of books. If one of these readers is selected at random, which of the following is closest to the probability that their favorite genre is NOT mystery or sports?

- (A) .34
- (B) .42
- (C) .47
- (D) .58

	Drama	Comedy	Total
Animated	2	45	47
Live-Action	28	15	43
Total	30	60	90

4. A group of moviegoers were asked for their preferences in movies. The table above shows those moviegoers' preferences. Based on the data in the table, what is the probability, rounded to the closest percentage, that a member of this subset who prefers animated movies over live-action movies does NOT prefer drama to comedy?

- (A) 2%
- (B) 33%
- (C) 52%
- (D) 95%

Hours of Sleep	Night 1	Night 2	Night 3	Total
4-5 hours	1	2	1	4
5-6 hours	3	4	2	9
6-7 hours	4	1	3	8
7-8 hours	1	2	2	5
8+ hours	1	1	2	4
Total	10	10	10	30

5. **FREE RESPONSE:** 10 people took part in a sleep study for three consecutive nights. The table above shows the number of hours of sleep each participant got on each of the three nights. If a participant is selected at random, what is the probability that the selected participant slept for more than 8 hours on either Night 1 or Night 3, given that the participant slept for more than 8 hours on at least one night of the study?

	Yes	No	N/A	Total
Issue A	15	5	3	23
Issue B	9	13	1	23
Issue C	12	4	7	23
Issue D	13	8	2	23
Total	49	30	13	92

6. The table above shows the results of 23 voters who each voted “yes,” “no,” or “no answer” to four different issues. If one of these voters is chosen at random, what is the probability that the voter did NOT vote “yes” on Issue B, given that they did not vote “no” on Issue B?

- (A) 0
- (B) $\frac{1}{10}$
- (C) $\frac{9}{23}$
- (D) $\frac{13}{23}$

Pet	Number of Owners
Dogs	5
Cats	n
Birds	7

7. FREE RESPONSE: The table above shows the results for a survey of a small group of pet owners who each owned one pet per person. If a person is selected at random from the surveyed group, there is a 20% probability that they own a cat. What is the value of n ?

	Male	Female
Freshman	15	17
Sophomore	12	x
Junior	16	18
Senior	11	14

8. FREE RESPONSE: The table above gives data about a group of high school students who participated in a community service project. If a sophomore or freshman from this community service project is chosen at random, the probability that they are a female freshman is $\frac{1}{4}$. What is the value of x ?

Career	Years of Experience				
	0-2	2-5	5-10	10-20	20+
Lawyer	3	4	3	1	2
Business Owner	1	2	3	4	1
Architect	2	2	2	1	1
Engineer	4	5	6	x	2
Artist / Musician	3	2	1	2	2
Medical	4	3	5	6	4

9. The table above shows a survey of people in a range of careers, along with the years of experience they have working in that field. Each person is only represented once within the table. If the probability is $\frac{1}{3}$ that a person with more than 10 years of experience selected at random from the table is an engineer or architect, what is the value of x ?

- (A) 4
 (B) 5
 (C) 7
 (D) 9

	Extreme Sport			
	Hang-Gliding	Motorcycle Racing	Skateboarding	Snowboarding
Visited Hospital	2	4	5	1
Not Visited Hospital	?	2	?	6

10. The table above shows the results of a survey of extreme sports participants. Each survey participant is only represented once in the table. The survey results were smudged in two categories and are illegible. If the probability is 50% that a survey participant has NOT been to the hospital and is NOT involved in motorcycle racing, what is the total number of hang-gliding and skateboarding participants?

- (A) 8
 (B) 15
 (C) 19
 (D) 23

Charts & Tables Practice Questions

YOU MAY USE A CALCULATOR ON ALL OF THE FOLLOWING QUESTIONS.

	Seeds	Pellets	Total
Finches	12	3	15
Parakeets	9	14	23
Total	21	17	38

1. The table above shows the food preferences of two types of bird in an aviary. What fraction of the parakeets prefer to eat seeds rather than pellets?

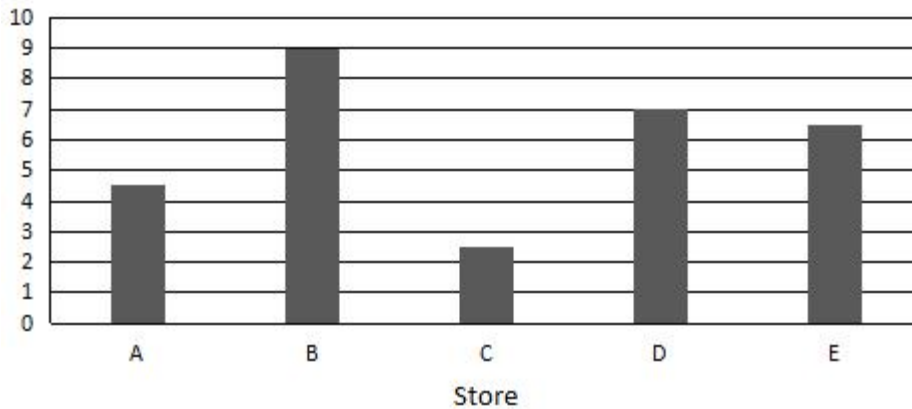
(A) $\frac{9}{23}$

(B) $\frac{3}{7}$

(C) $\frac{9}{14}$

(D) $\frac{4}{5}$

Sales of Potato Chips in 5 Convenience Stores
(in May)

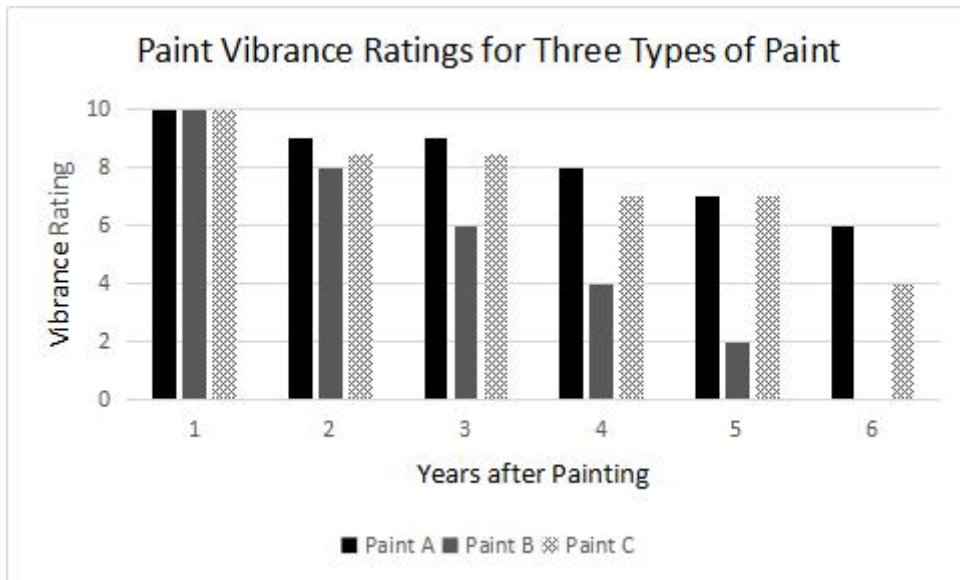


2. The total sales volume of potato chips in five different convenience stores for the month of May is shown in the bar chart above. If the total volume of sales in dollars is \$29,500 for the month of May, what is an appropriate label for the vertical axis of the chart?
- (A) Potato chip sales (in tens of dollars)
 - (B) Potato chip sales (in hundreds of dollars)
 - (C) Potato chip sales (in thousands of dollars)
 - (D) Potato chip sales (in tens of thousands of dollars)

		Preferred Winter Clothing				
		Sweater	Jacket	Sweatshirt	Poncho	Total
Gender	Male	6	11	9	4	30
	Female	15	7	8	1	31
Total		21	18	17	5	61

3. A group of high school students were surveyed about their favorite winter clothing. The survey data was broken down as shown in the table above. Which of the following categories represents approximately 25 percent of all the survey respondents?
- (A) Males who prefer sweatshirts
 - (B) Males who prefer ponchos
 - (C) Females who prefer jackets
 - (D) Females who prefer sweaters

QUESTIONS 4 AND 5 RELATE TO THE FOLLOWING BAR CHART:



4. Three houses were each painted with a different type of newly-developed paint designed to resist rain and sun without fading. For six years after the initial painting, the vibrance of the paint was measured on a 1-10 scale, with 10 being the most vibrant. The bar chart above shows the vibrance ratings for each of the three types of paint from 1 to 6 years after the paint was applied. Which of the following paint types showed a decrease in vibrance every year after the initial paint was applied?

- I. Paint A
- II. Paint B
- III. Paint C

- (A) II only
- (B) III only
- (C) II and III only
- (D) I, II, and III

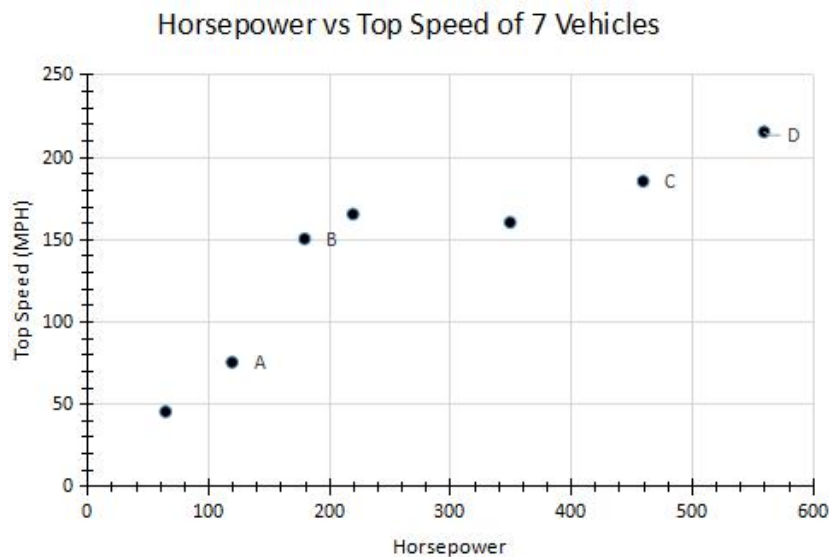
5. Of the following, which is the closest to the ratio of the total vibrance rating of all three paints in the fifth year after painting to the total vibrance rating in the first year after painting?

- (A) 1 to 3
- (B) 8 to 15
- (C) 3 to 5
- (D) 4 to 5

	Adults	Children	Total
Soccer	29	57	86
Baseball	46	18	64
Total	75	75	150

6. Two researchers were studying the preferred sport of children and adults in America as part of a research paper on the changing preferences of Americans over generations. The table above shows the results of a survey that recorded the preferred sport of a group of adults and children between soccer and baseball. What proportion of children reported that baseball was their preferred sport?

- (A) $\frac{6}{25}$
- (B) $\frac{9}{32}$
- (C) $\frac{18}{57}$
- (D) $\frac{57}{75}$



7. The scatterplot above charts the relationship of horsepower to top speed for seven different vehicles. What is the horsepower of the vehicle with the highest top speed?

- (A) 60
- (B) 220
- (C) 560
- (D) 600

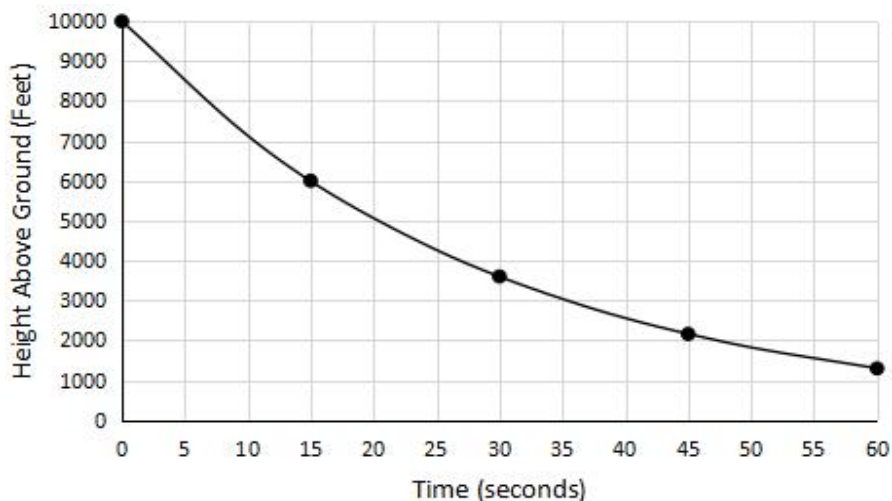
Energy per Gram of Macronutrient

Macronutrient	Calories
Protein	4
Fat	9
Carbohydrate	4

8. The table above shows the typical number of calories per gram of three major macronutrients present in food. If the 1200 calories in a cheeseburger come entirely from p grams of protein, f grams of fat, and c grams of carbohydrate, which of the following expresses c in terms of p and f ?

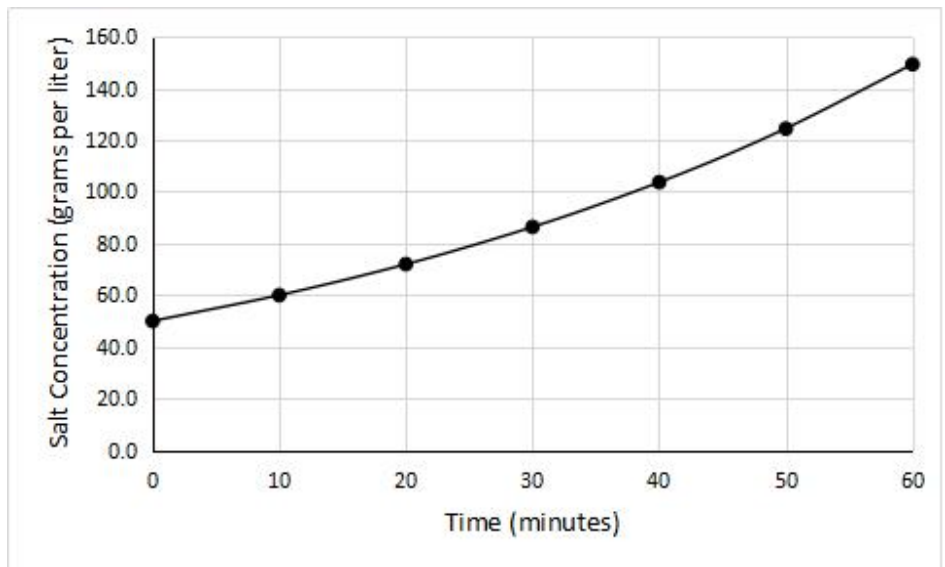
- (A) $c = 300 - p - \frac{4}{9}f$
- (B) $c = 300 - p - \frac{9}{4}f$
- (C) $c = 1200 - p - \frac{9}{4}f$
- (D) $c = 1200 - \frac{9}{4}(p - f)$

Seconds after drop	Height above ground
0	10000
15	6000
30	3600
45	2160
60	1296



9. FREE RESPONSE: A certain experimental type of parachute is tested from a height of 10,000 feet above ground. The table and graph above show the height above ground for a fall lasting 60 seconds before the parachute is recovered mid-air. Assuming the rate of descent in feet per second is the same if the parachute is dropped from a height of 12,000 feet, what is the difference in height above ground (in feet) between the parachute dropped at 12,000 feet after 15 seconds compared to the height above ground of the parachute dropped at 10,000 feet after 30 seconds?

Time (minutes)	Salt concentration (grams per liter)
0	50.0
10	60.0
20	72.0
30	86.4
40	103.7
50	124.4
60	149.3



10. FREE RESPONSE: A student is performing an experiment on the salt concentration over time in three liters of saline solution. She adds salt to the solution continuously over a 60 minute period using a mechanical dispenser that operates according to an exponential formula. The table and graph above show the concentration of salt in the solution at 10-minute intervals over time. According to the data, how many more grams of salt are present in .7 liters of the solution after 10 minutes of her experiment than are present in .3 liters of the solution after 30 minutes? (Round your answer to the nearest whole number).

Basic Statistics Practice Questions

YOU MAY USE A CALCULATOR ON ALL OF THE FOLLOWING QUESTIONS.

{10, 4, -1, -2, 10, 3}

Set A: {5, -2, 11, 13, -5, 9, -8}

1. What are the median, mean, mode, and range of the data set above?

Set B: {5, 4, 6, 5, 4, 4, 6}

3. Which of the following statements is true of the two sets shown above?
- (A) The Standard Deviation of Set A is higher than the Standard Deviation of Set B, and the Range of Set A is greater than the Range of Set B.
- (B) The Standard Deviation of Set B is higher than the Standard Deviation of Set A, and the Range of Set A is greater than the Range of Set B.
- (C) The Standard Deviation of Set B is higher than the Standard Deviation of Set A, and the Range of Set B is greater than the Range of Set A.
- (D) The Standard Deviation of Set A is higher than the Standard Deviation of Set B, and the Range of Set B is greater than the Range of Set A.

Age	Frequency
18	3
19	4
20	7
21	6
22	4
23	4
26	1
31	1

2. The table above shows the distribution of ages of 30 students enrolled in a college physics class. Which of the following gives the correct order of the mean, median, and mode of the ages?
- (A) mode < median < mean
- (B) mode < mean < median
- (C) median < mode < mean
- (D) mean < median < mode

4. A certain data set consists of 16 positive integers. The maximum value of this set is 40 and the minimum value is 17. If another integer is added to create a new data set, and the value of this new integer is 14, which of the following measures must increase by 3 from the original data set to the new data set?

- (A) The range
- (B) The median
- (C) The mean
- (D) The mode

Color	Percent of Respondents
Red	22%
Purple	3%
Orange	6%
Blue	36%
Yellow	13%
Gold	1%
Green	19%

5. A survey was given to a set of people to determine their favorite colors. The results from this survey are given in the table above. In a previous survey, the researchers found that the color with a median percent of popularity was green, with 18% of survey respondents in that survey choosing it as their favorite color. What is the difference between the median percent of popularity in the new survey compared to the median percent of popularity in the previous survey?

- (A) 1%
- (B) 5%
- (C) 12%
- (D) 18%

Number of Plants	Number of Leaves
8	0-10
9	11-20
9	21-30
6	31-40
7	41-50
11	51-60
10	61-70
7	71-80
3	81-90
2	91-100
1	101-110

6. A biologist was researching the number of leaves that grew from a set of 73 plants within the first 30 days after sprouting. The table above shows these results. Based on the table, what was the median number of leaves for the 73 plants?

- (A) 31-40
- (B) 41-50
- (C) 51-60
- (D) 81-90

7. A turtle rancher weighed each of his 25 turtles, and the mean, median, range, and standard deviation for the data were found. The turtle with the highest recorded weight was re-weighed and found to actually weigh 2 pounds more than originally measured. What value remains unchanged if the four values are recalculated using the correct weight?

- (A) Range
- (B) Mean
- (C) Standard Deviation
- (D) Median

8. The tables below give the distribution of people in attendance for two events, a concert and a play, over the same 30 days in April.

Concert:

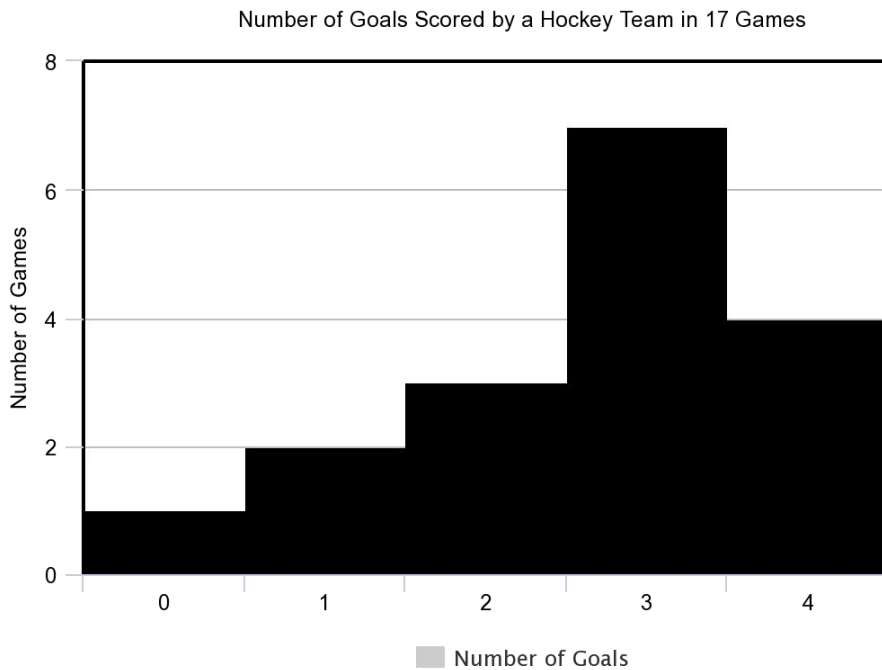
Attendance	Frequency
0	5
10	4
20	6
30	3
40	5
50	7

Play:

Attendance	Frequency
0	1
10	3
20	7
30	12
40	5
50	2

Which of the following is true about the attendance data for the two events?

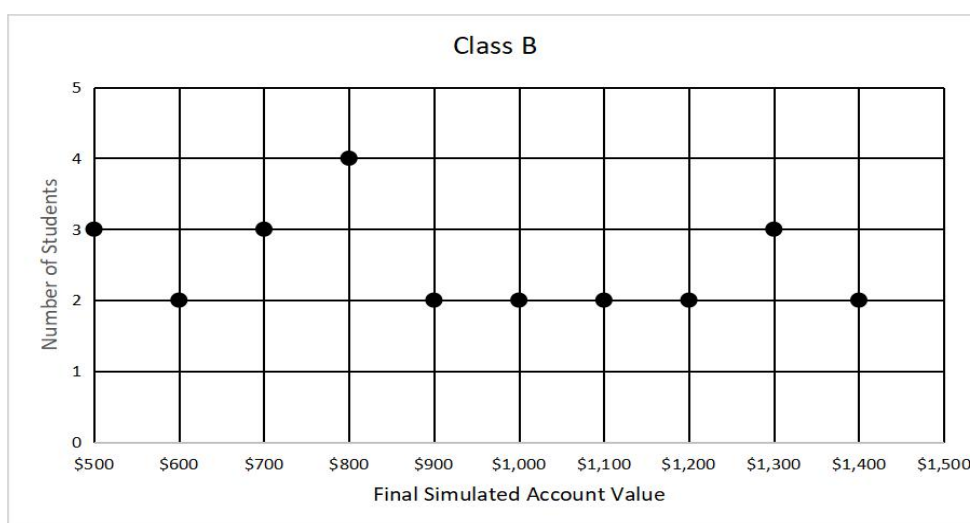
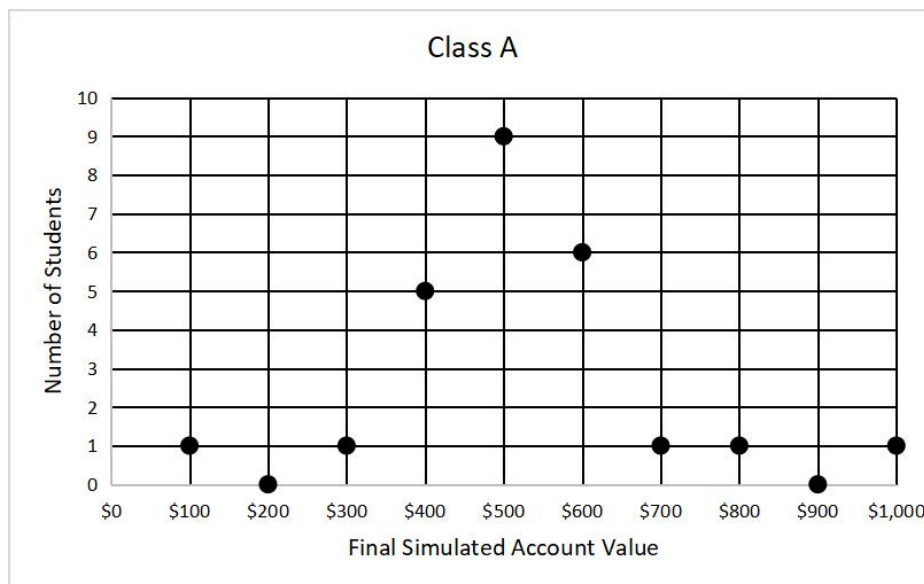
- (A) The standard deviation of attendance for the concert is the same as for the play.
- (B) The standard deviation of attendance for the play is larger.
- (C) The standard deviation of attendance for the concert is larger.
- (D) The standard deviation of attendance for these two events cannot be calculated from the data provided.



9. FREE RESPONSE: Based on the graph above, in how many games played did the hockey team score goals equal to the median number of goals for the 17 games?

550	560	575	580	600	610	635	655
655	655	675	680	695	700	705	705
710	715	725	725	730	740	755	805

10. The table above lists the masses, to the nearest milligram, of a random collection of 24 guitar picks at a music store. If the mass of the heaviest pick is considered an outlier and removed from the data, which will change the most?
- (A) Mean
 (B) Median
 (C) Range
 (D) Mode



11. Two economics classes of 25 students each both played a mock investment game in which each student was given a simulated amount of money to invest. The final values of the students' simulated accounts for both classes are shown in the two charts above. If S_A and S_B represent the standard deviations and R_A and R_B represent the ranges for Class A and Class B, respectively, which of the following choices correctly expresses the relationship of the two classes' range and standard deviation for their final account values?

- (A) $S_A < S_B$ and $R_A < R_B$
- (B) $S_B < S_A$ and $R_A = R_B$
- (C) $S_A < S_B$ and $R_A = R_B$
- (D) $S_A = S_B$ and $R_A = R_B$

12. A researcher chose 450 people at random from each of two cities and asked each person how many vehicles he or she owns. The results are shown in the table below.

Number of Vehicles	City A	City B
0	100	50
1	75	50
2	50	100
3	150	125
4	75	125

What is the median number of vehicles owned for all the people surveyed?

- (A) 0
- (B) 1
- (C) 2
- (D) 3

Statistics Conclusions Practice Questions

YOU MAY USE A CALCULATOR FOR ALL OF THE FOLLOWING PRACTICE PROBLEMS.

1. A motorcycle design team selected 300 people at random from a group of people who indicated they liked a certain vintage motorcycle. The 300 people were shown a new bicycle design based on the vintage motorcycle and then asked whether they liked or disliked the bicycle design. Of those surveyed, 80% said they liked the bicycle design. Which of the following inferences can appropriately be drawn from this survey result?

 - (A) At least 80% of people who like vintage motorcycles will like this bicycle design.
 - (B) At least 80% of people who ride bicycles will like this bicycle design.
 - (C) Most people who like the vintage motorcycle will probably also like the bicycle design.
 - (D) Most people who dislike the vintage motorcycle will dislike the bicycle design.
2. To determine the dessert preferences of a small town, a researcher surveyed 53 customers leaving an ice cream shop. The survey result indicated that nearly 95% of the population of the town enjoyed ice cream. Which of the following statements must be true?

 - (A) Approximately 95% of the people in the town most likely enjoy ice cream.
 - (B) Approximately 5% of the people in the town do not like ice cream.
 - (C) A determination about the dessert preferences of the small town should not be made because the sample size is too small.
 - (D) The sampling method is flawed and may produce a biased estimate of the dessert preferences of the small town.

3. A study was done on the heights of different types of trees on a mountain. A random sample of trees were marked in order to ensure that none were measured more than once. The sample contained 214 pine trees, of which 20% were more than 80 feet in height. Which of the following conclusions is best supported by the sample data?
- (A) The majority of all trees on the mountain are less than 80 feet in height.
 - (B) The average height of all the trees on the mountain is approximately 80 feet.
 - (C) Approximately 80% of all trees on the mountain are less than 80 feet in height.
 - (D) Approximately 20% of all pine trees on the mountain are more than 80 feet in height.
4. A tutoring company has 30 tutoring centers located in different areas across four states. A researcher for the company believes that student satisfaction with tutoring lessons varies greatly from center to center. Which of the following sampling methods is most appropriate to estimate the proportion of all students who are satisfied with their tutoring lessons?
- (A) Selecting 5 students from each tutoring center at random and then surveying each student selected.
 - (B) Creating a website on which students can express their opinions and then using the first 30 responses.
 - (C) Surveying the 15 youngest students and the 15 oldest students.
 - (D) Selecting one of the 30 tutoring centers at random and then surveying each student at that center.
5. In order to determine if treatment K is successful in reducing knee joint pain, a research study was conducted. From a large population of people with knee joint pain, 500 participants were selected at random. Half of the participants were randomly assigned to receive treatment K and the other half received a placebo treatment. The resulting data showed that most participants who received treatment K experienced significantly reduced knee joint pain levels as compared to those who received the placebo treatment. Based on the design and results of the study, which of the following is an appropriate conclusion?
- (A) Treatment K is likely to reduce the joint pain levels of anyone with joint pain.
 - (B) Anyone who receives Treatment K will experience a reduction of knee joint pain levels.
 - (C) Treatment K is likely to reduce the knee joint pain levels of people with knee joint pain.
 - (D) Treatment K is the most effective knee joint pain treatment available.

6. Near the end of a certain talk show on radio in Country X, the station asked listeners to respond by calling in to answer the question “Do you disagree with the upcoming changes to property tax policy?” At the end of the talk show, the hosts reported that 85% responded “Yes” and 12% responded “No.” Which of the following best explains why the results are unlikely to represent the feelings of the population of Country X?
- (A) There were not enough responses to the station’s poll for it to be valid.
 - (B) The percentages do not add up to 100%, so any conclusion from this poll is invalid.
 - (C) The poll did not allow respondents to answer the question via other methods, such as text or social media.
 - (D) The respondents to the poll were not a random sample of the population of Country X.
7. A student in a statistics class surveyed a random sample of fellow students at their large university about how often they played with cats or dogs. Using the sample data, the student estimated that 47% of the students in the population played with a cat or a dog at least once per month. The margin of error for this estimation is 3%. Which of the following is the most appropriate conclusion about all students at the university, based on the given estimate and margin of error?
- (A) The researcher is between 44% and 50% sure that most students play with a dog or a cat at least once per month.
 - (B) It is plausible that the percentage of students who play with a cat or a dog at least once per month is between 44% and 50%.
 - (C) It is likely that 3% of students do not play with a cat or a dog each month.
 - (D) At least 47%, but no more than 50%, of the students play with a cat or a dog each month.
8. A researcher conducted a survey to determine whether people in a certain large town prefer communicating in online forums or in person. The researcher asked 102 people at a local mall on Friday, and 3 people refused to respond. Which of the following factors make it least likely that a reliable conclusion can be drawn about the communication preferences of all people in the town?
- (A) Sample size
 - (B) Population size
 - (C) The number of people who refused to respond
 - (D) Where the survey was given

9. A survey was taken of the value of homes in a certain neighborhood, and it was found that the median home value was \$165,000 and the mean home value was \$130,000. Which of the following situations could explain the difference between the median and mean home values in the neighborhood?
- (A) Many of the homes are valued between \$165,000 and \$130,000.
 - (B) There are a few homes that are valued much less than the rest.
 - (C) There are a few homes that are valued much more than the rest.
 - (D) Information on home value was not available for several homes in the neighborhood.
10. In a certain talent-competition TV show, viewers could use either their phone or a personal computer to vote for their favorite of two contestants, Contestant A or Contestant B. The contestant receiving more than 50% of the vote won the competition. An estimated 12% of all viewers voted, and 80% of the votes were cast over the phone. Contestant A earned 20% of the votes cast by phone and 70% of the votes cast by personal computer. Based on this information, which of the following is an accurate conclusion?
- (A) If only voting by personal computer was allowed, Contestant A would have won.
 - (B) Contestant B was more likely preferred by younger viewers.
 - (C) The vote is invalid because the votes were not cast 50% by phone and 50% by personal computer.
 - (D) Viewers voting by phone were less likely to prefer Contestant A than Contestant B.