Data Analysis

1. A set of data is arranged in numerical order. What value represents the spread of the middle half of the data?

   A. interquartile range

   B. mean

   C. median

   D. range

2. A set of data is written in numerical order. Which term describes the spread of the middle half of the data?

   A. mean

   B. median

   C. interquartile range

   D. range

3. The salaries of 12 employees are given below.

   $19,000 $20,000 $25,000 $26,000
   $28,000 $29,000 $30,000 $31,000
   $32,000 $37,000 $37,000 $85,000

   The employees are asking for a pay raise. Which **measure of central tendency** should they quote as a justification for their pay raise?

   A. Median, because it represents the lowest measure.

   B. Range, because it represents the highest measure.

   C. Mean, because it includes all salaries when it is calculated.

   D. Mode, because the most people are earning that salary.

4. Use the set of numbers below.

   5 5 7 8 9 11 12 17 30 40

   Which of the following numbers, when included in the set, would change the mean but not the median or mode?

   A. 0

   B. 5

   C. 10

   D. 15

5. A student scored 98, 84, and 90 on three exams this semester. There is one exam remaining. What score does the student need to achieve on the last exam to have an overall mean of 88 on his exams?

   A. 80

   B. 89

   C. 90

   D. 91

6. The table below is the menu at a snack stand.

Refreshments	Price
Pizza	$2.00
Cookies	$1.00
Ice Cream	$1.00
Popcorn	$1.25
Hot Dogs	$2.00
Granola Bars	$1.00
Soda	$1.25
Bottled Water	$0.50

   A new item is added to the menu which changes the median price to $1.25, but does **not** change the mean price. What is the price of the new item?

   A. $1.00

   B. $1.25

   C. $1.50

   D. $2.00

7. A group of 30 people was asked, "What is your favorite type of pet?" The results of the survey are shown below.

Favorite Type of Pet	Number of People
Dog	12
Cat	9
Fish	5
Bird	2
Iguana	2

   Which of these is a true statement about the data?

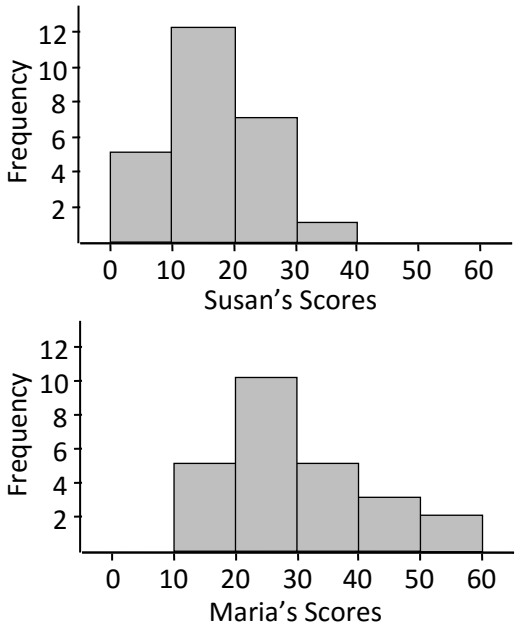
   A. The mean is 6.

   B. The mode is 2

   C. The mode is dog.

   D. The median is fish.

Questions 8 and 9. The histograms below show the number of points scored by two basketball players: Susan and Maria. Each played in 25 games.



8. Which statement is true when comparing Susan's and Maria's scores?

   A. Susan's mean score is higher and Maria's scores are more variable.

   B. Susan's mean score is higher and Susan's scores are more variable.

   C. Maria's mean score is higher and Maria's scores are more variable.

   D. Maria's mean score is higher and Susan's scores are more variable.

9. Which could be the range of Maria's scores?

   A. 58 points

   B. 48 points

   C. 28 points

   D. 8 points

10. A radio station is considering changing its format from country-western music to hip-hop. It asks its current listeners to call in and give their opinion about the change. Which BEST describes why this survey is **biased**?

    A. Current listeners will not want a change in format.

    B. Some listeners may call in more than once.

    C. Some listeners may not learn about the survey and couldn't give their opinion.

    D. The station may not have enough phone lines to handle all the listeners' calls.

11. Which best describes a **biased** survey?

    A. Taking a survey at a basketball game about fans' favorite foods to eat while watching a game.

    B. Taking a survey at a high school campus about teenagers' favorite music.

    C. Taking a survey at a vegetarian food market about shoppers' favorite type of chicken.

    D. Taking a survey at a convention of retired persons about good retirement funds.

12. A definition of biased sampling is

    A. a method of selection that includes the whole population.

    B. a method of selection that excludes certain parts of the population.

    C. a method of selection that ensures the sample represents the population.

    D. a method of selection that results in a sample smaller than the population.

13. Tony rolls a fair, six-sided die, then tosses a fair coin 2 times. What is the probability he rolls an even number followed by two heads?

    A. $\frac{1}{24}$

    B. $\frac{1}{8}$

    C. $\frac{1}{4}$

    D. $\frac{1}{2}$

14. Two fair, six-sided dice are rolled. What is the probability that the sum of the two dice is 3 or 7?

    A. $\frac{2}{36}$

    B. $\frac{8}{36}$

    C. $\frac{12}{36}$

    D. $\frac{18}{36}$

15. A student tosses a fair coin 3 times and all 3 results are heads. What is the probability that the next toss will be heads?

A. 0%

B. 25%

C. 50%

D. 100%

16. Two students did surveys for a class project. Descriptions of their surveys are listed below.

- Raphael wanted to know where his classmates were born. Each student in the class was asked to give his birthplace.
- Anne wanted to know about the recycling program at school. Twenty freshmen, twenty sophomores, twenty juniors, and twenty seniors were randomly selected and asked their opinions about recycling.

Which statement is correct?

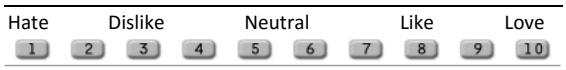
A. Raphael took a sample and Anne did a census.

B. Raphael did a census and Anne took a sample.

C. Both students took a sample.

D. Both students did a census.

17. Mr. Garcia asked the students in one of his honors math classes to rank how much they enjoy working on math problems. The students were asked to use the following scale.



All students in the class responded and the mean was 8. Does this support the claim that all honors math students enjoy working on math problems?

A. Yes, because honors students are good at math.

B. Yes, because Mr. Garcia took a census of the entire class.

C. No, because the mean might have been affected by a few students selecting 10 as their ranking.

D. No, because Mr. Garcia's class may not be representative of all honors math classes.

18. The table below shows the profit (in thousands of dollars) earned by a company in each of five recent years.

Year	2004	2005	2006	2007	2008
Profit (x1000)	$106	$342	$498	$571	$632

Between which two consecutive years did the company show the greatest increase in profits?

A. 2004 to 2005

B. 2005 to 2006

C. 2006 to 2007

D. 2007 to 2008

19. A sandwich shop advertises it can make 110 different sandwiches consisting of one type of bread, one type of meat, and one type of cheese. The shop offers two types of bread and five types of meat. How many different types of cheese does the shop offer?

A. 10

B. 11

C. 22

D. 55

20. Eight swimmers are competing in a race. How many different ways could the swimmers place 1st, 2nd, and 3rd?

A. 24

B. 56

C. 336

D. 512

21. A drama teacher is randomly choosing students for r different roles in a play. There are 8 students from which to choose and the number of possible outcomes is 56. How many roles r are in the play?

A. $r = 2$

B. $r = 3$

C. $r = 5$

D. $r = 7$

22. A four-character password consists of one letter from the word MATH, followed by three digits which may be 1, 2, or 3. If the digits may be used more than once, how many **more** passwords can be made than if the numbers are used only once?

A. 12

B. 24

C. 84

D. 108

23. An ice cream shop advertises that they can make sundaes 36 different ways. A sundae consists of one sauce (chocolate, caramel, butterscotch), one nut (peanuts, walnuts, pecans), and one fruit. What is the fewest number of fruits the shop can offer to make 36 different sundaes?

A. 4

B. 9

C. 12

D. 30

24. Brand X locks use a 2-character code made up of the digits 0 through 9 which MAY NOT repeat. Brand Y locks use a 3-character code also made up from the digits 0 through 9 which MAY repeat. How many more different codes can Brand Y locks use than Brand X locks?

A. 620

B. 630

C. 900

D. 910

25. A class has 25 students. The teacher randomly chooses 3 students to form a line. If the order of selection is important, how many different lines could be created?

A. $25!(3!)$

B. $\frac{25!}{(25-3)!}$

C. $\frac{25!}{3!(25-3)!}$

D. $25!$

26. What is the number of combinations of 7 things taken 3 at a time?

A. 21

B. 35

C. 210

D. 343

27. There are 10 cats in a pet show. A group of 3 cats will be selected as finalists. How many different groups of cats could be finalists?

A. 13

B. 30

C. 120

D. 720

28. A group of 3 different desserts is chosen from a menu of 10 desserts. Which expression represents all possible combinations of 3 desserts?

A. $10!$

B. $\frac{10!}{3!}$

C. $\frac{10!}{(10-3)!}$

D. $\frac{10!}{(10-3)!3!}$

29. The cafeteria sells bagged lunches. Each randomly packed bag contains a sandwich, a vegetable, and a drink. The quantities of each item produced are given below.

sandwiches: equal numbers of turkey, ham, tuna, or peanut butter

vegetables: equal numbers of carrots or celery

drinks: equal numbers of apple juice, grape juice, or milk

A student randomly chooses a bagged lunch. What is the approximate probability that he got his favorite lunch: a ham sandwich, carrots, and apple juice?

A. 4%

B. 6%

C. 11%

D. 17%

30. The stem-and-leaf plot below shows the speeds of eight cars on a highway.

4	9
5	2 2 3 5 6
6	1 2

4|9 represents 49 miles per hour

What is the median speed?

A. 52 mph

B. 53 mph

C. 54 mph

D. 55 mph

31. The stem-and-leaf plot below shows a student's times taken to complete 14 homework assignments over a three-week period.

3	**5 6 6 7 9**
4	**1 1 4 5 7**
5	**0 4 5 8**

Key 5|0 = 50 minutes

What is the **range** of the times taken to complete the homework assignments?

A. 11 minutes

B. 15 minutes

C. 19 minutes

D. 23 minutes

32. A student rolled a pair of fair, six-sided, dice sixty times and recorded the sums in the frequency table below.

2	I
3	II
4	III
5	𝍸 I
6	𝍸 II
7	𝍸 𝍸 𝍸
8	𝍸 𝍸
9	𝍸 I
10	𝍸
11	III
12	II

Which comparison is true about the theoretical probability of rolling a sum of 7 and the student's experimental results of rolling a sum of 7?

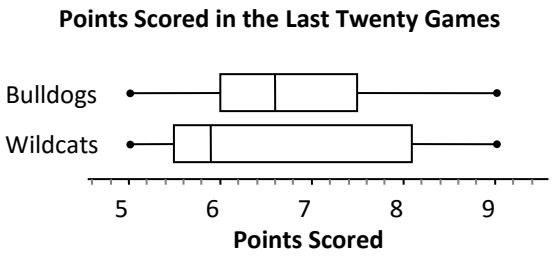
A. The theoretical probability is less than the experimental probability.

B. The theoretical probability is greater than the experimental probability.

C. The theoretical and experimental probabilities are equal.

D. There is insufficient information to compare the theoretical and experimental probabilities.

33. The box-and-whisker plots below show the distributions of the points scored by two basketball teams in their last twenty games.



Which is a correct conclusion about the scores of the two teams' last twenty games?

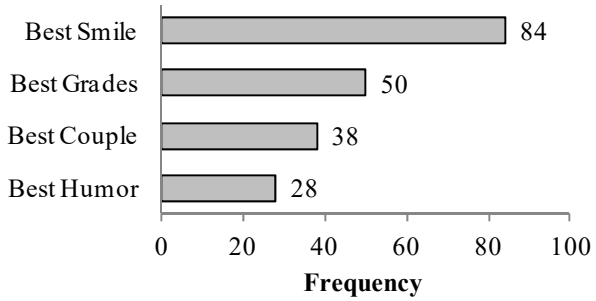
A. The interquartile ranges are the same for both teams.

B. The range for the Wildcats is greater than the range for the Bulldogs.

C. The Bulldogs scored greater than 80 points in more games than the Wildcats.

D. The Wildcats scored fewer than 60 points in more games than the Bulldogs.

34. The seniors at East High School voted for their favorite category for the yearbook. The results of the vote are represented in the bar graph.



Which category received more than 20% of the vote but less than 30% of the vote?

A. Best Smile

B. Best Grades

C. Best Couple

D. Best Humor

35. The data below are the player ratings of 11 members of a golf team.

6	**8**	**13**	**15**	**15**	**20**
21	**22**	**23**	**29**	**34**	

What is the interquartile range of the ratings?

A. 10

B. 14

C. 20

D. 28

36. Two dice are rolled. The **number** of dice showing "6" is counted. Which is the correct sample space?

A. {6}

B. {0, 1, 2}

C. {0, 6, 12}

D. {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

37. A bag contains 16 chocolate, 12 caramel, and 8 almond candies. One candy is chosen randomly. What is the probability that the chosen candy is a caramel?

A. $\frac{1}{4}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

D. $\frac{5}{8}$

38. A donut display case has 6 glazed, 3 chocolate, and 3 sugar donuts. A customer randomly selects 3 donuts, without replacement. What is the probability of choosing 2 glazed donuts and 1 sugar donut?

A. $\frac{6}{12} \cdot \frac{6}{12} \cdot \frac{3}{12}$

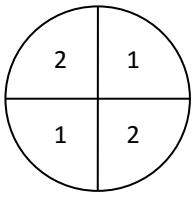
B. $\frac{6}{12} \cdot \frac{6}{11} \cdot \frac{6}{10}$

C. $\frac{6}{12} \cdot \frac{5}{12} \cdot \frac{3}{12}$

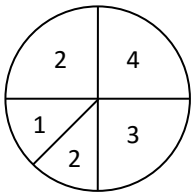
D. $\frac{6}{12} \cdot \frac{5}{11} \cdot \frac{3}{10}$

39. Which spinner, when spun once, has the highest probability of landing on the numeral 1?

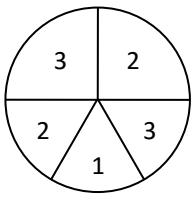
A.



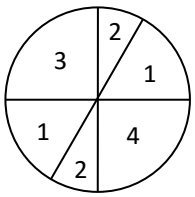
B.



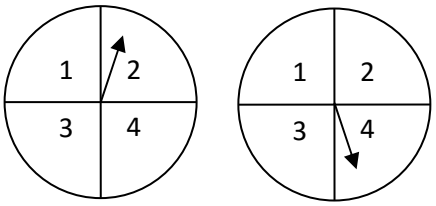
C.



D.



40. A game uses the two fair spinners shown below.



Both spinners are spun and the two numbers are added. If a player has that sum, it is crossed off the game card. Only one total may be crossed off per turn. The first player to cross of all numbers wins.

Which game card should be chosen so a player has the best chance of winning?

A.

1	2	3
4	■	5
6	7	8

B.

2	2	3
4	■	6
7	8	8

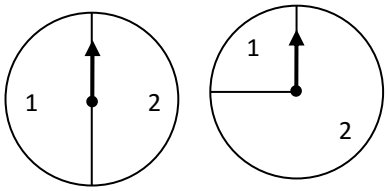
C.

3	4	5
5	■	5
5	6	7

D.

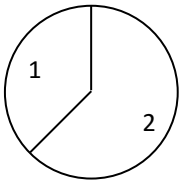
2	3	4
5	■	5
6	7	8

41. A game uses the two spinners shown below.

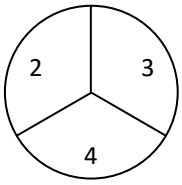


Each spinner is spun once and the two results are added to determine a player's move. Which circle graph shows the distribution of possible moves?

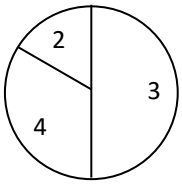
A.



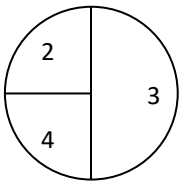
B.



C.



D.



42. The matrix below represents the inventory at a clothing store.

	Small	Medium	Large
Shirts	**490**	**530**	**602**
Sweaters	**250**	**360**	**420**
Pants	**321**	**500**	**615**

How many medium sweaters does the store have in stock?

A. 250

B. 360

C. 420

D. 530

43. The table below shows the numbers of snacks sold at a concession stand during two different games.

	Basketball Game		Football Game	
Item	**Small**	**Large**	**Small**	**Large**
Popcorn	24	14	62	51
Nachos	18	11	28	19
Soda	31	27	54	65

How many small sodas were sold altogether?

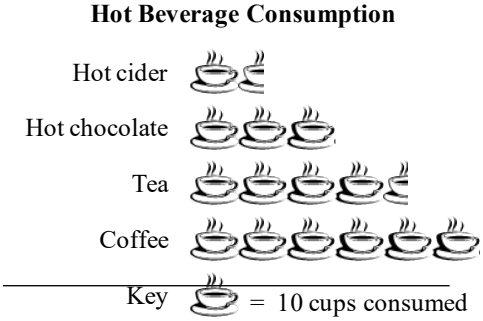
A. 23

B. 31

C. 54

D. 85

44. The pictograph below shows the number of hot beverages consumed at a restaurant.



How many more cups of coffee than cups of hot cider were consumed?

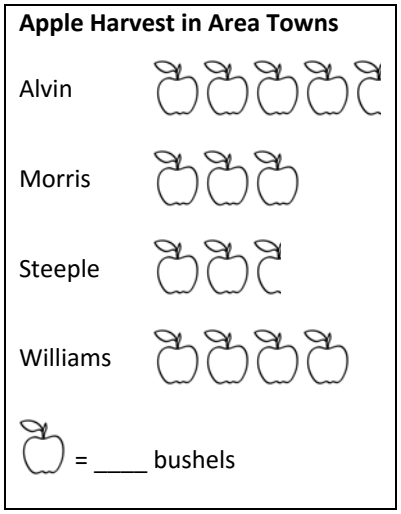
A. 15

B. 40

C. 45

D. 60

45. The key is missing from the graph below.



Morris and Williams harvested 560 bushels of apples. How many bushels does each apple in the graph represent?

A. 7

B. 14

C. 40

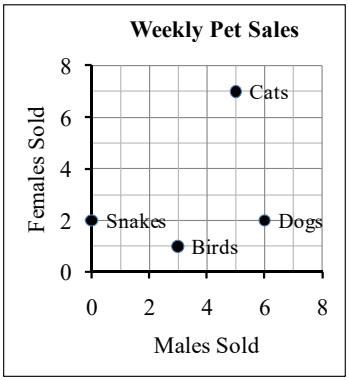
D. 80

Weekly Pet Sales

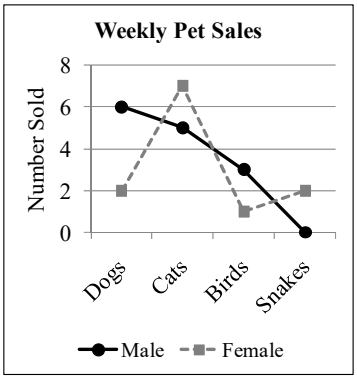
	Male	Female
Dogs	**6**	**2**
Cats	**5**	**7**
Birds	**3**	**1**
Snakes	**0**	**2**

Which graph best describes the sales information given in the table?

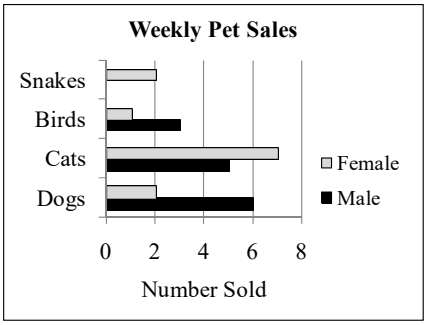
A.



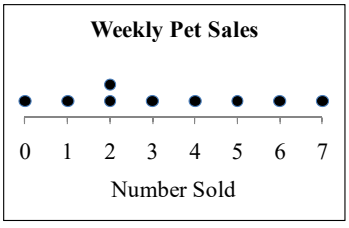
B.



C.

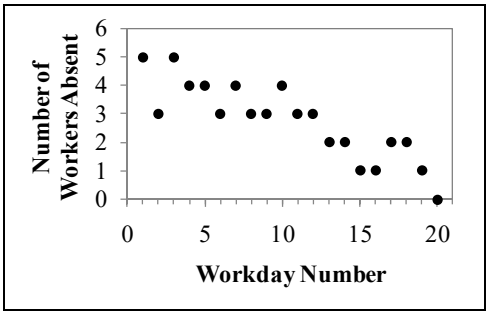


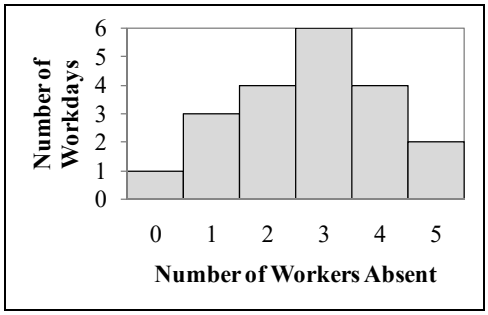
D.



46. The table below shows the quantities of various types of pets, by gender, sold at a pet store during a one-week period.

47. A large company charted employee absences for the past month (20 workdays). The company represented the data in a scatterplot and a histogram. The charts are shown below.





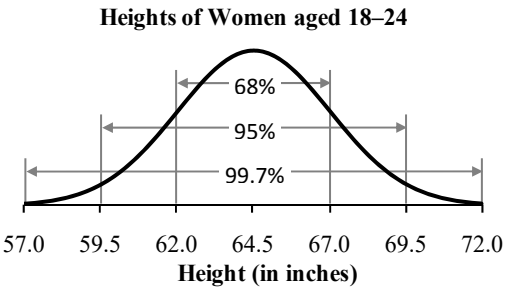
What fact is obvious from the scatterplot that is not obvious from the histogram?

A. A typical employee was absent an average of 3 days this month.

B. More workers were absent early in this month than late in the month.

C. On most days this month, there were 2 to 4 workers absent.

D. Next month, fewer than 2 workers will probably be absent on any given day.



Based on the graph, which statement is correct?

A. There are more women in this age group taller than 69.5 inches than there are shorter than 59.5 inches.

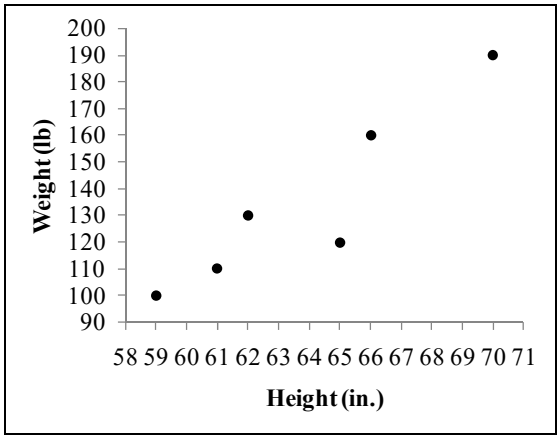
B. Most women who are older than 24 years are taller than 72 inches.

C. Less than one-third of the women in this age group are taller than 64.5 inches.

D. There are about as many women in this age group shorter than 62 inches as there are taller than 67 inches.

48. The heights of women aged 18–24 years can be described with a normal distribution. A graph of the distribution is shown below.

49. Use the graph below.



Which table represents the information shown in the graph?

A.

Height (in.)	59	60	62	65	66	70
Weight (lb)	115	110	130	120	160	170

B.

Height (in.)	59	60	62	65	66	70
Weight (lb)	100	110	130	120	160	190

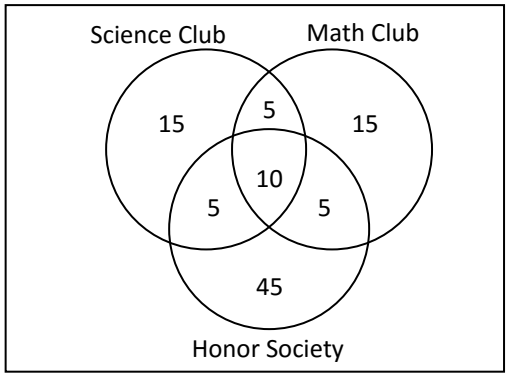
C.

Height (in.)	59	61	62	65	66	70
Weight (lb)	100	110	130	120	160	190

D.

Height (in.)	59	61	62	65	66	70
Weight (lb)	115	110	130	120	160	170

50. The Venn Diagram below shows the numbers of students who are in Science Club, Math Club, and Honor Society.



If a student is chosen at random, what is the probability that the student is in math club and in science club?

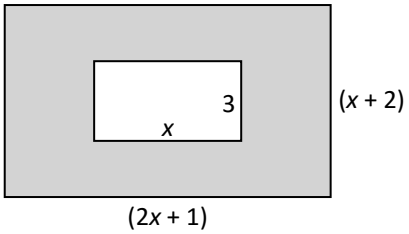
A. 25%

B. 20%

C. 15%

D. 10%

51. The figure below shows a smaller rectangle inside a larger rectangle.



What is the area of the shaded region?

A. $2x^2 + 2x + 2$

B. $2x^2 + 3x + 2$

C. $2x^2 + 5x + 2$

D. $2x^2 + 8x + 2$