1. Maria is completing a survey to use for a project in her statistics class. She went to two local stores and asked 10 randomly selected patrons to give their ages. The data she collected is shown below.

Store 1	42	30	25	26	39	30	15	60	30	39
Store 2	79	59	67	89	68	79	79	67	85	91

mode the piece of data repeated most often

How does the <u>mode</u> of Maria's data at Store 1 differ from the mode at Store 2?

30   79

$$\begin{array}{r} 79 \\ -30 \\ \hline 49 \end{array}$$

○ A. The mode of Maria's data at Store 1 is less than the mode at Store 2 by 28.

○ B. The mode of Maria's data at Store 1 is greater than the mode at Store 2 by 28.

○ C. The mode of Maria's data at Store 1 is less than the mode at Store 2 by 49.

○ D. The mode of Maria's data at Store 1 is greater than the mode at Store 2 by 49.

2. Michael and Stanley both work for the same company in sales. Their supervisor announced that the salesperson with the highest cumulative sales numbers over the last six months will receive a bonus. Below is a table showing the worth of the goods sold by Michael and Stanley for each of the last six months.

	March	April	May	June	July	August
Michael	$57,809.00	$64,421.00	$69,398.00	$59,100.00	$55,688.00	$46,339.00
Stanley	$47,156.00	$56,373.00	$53,596.00	$61,524.00	$54,804.00	$58,586.00

How does the range of Michael's sales numbers compare to the range of Stanley's sales numbers?   √ the difference between the lowest and highest data values

○ A. The range of Michael's sales numbers is greater than the range of Stanley's sales numbers by $5,677.00.

○ B. The range of Michael's sales numbers is greater than the range of Stanley's sales numbers by $8,691.00.

○ C. The range of Michael's sales numbers is less than the range of Stanley's sales numbers by $8,691.00.

○ D. The range of Michael's sales numbers is less than the range of Stanley's sales numbers by $8,883.00.

Michael: 69,398 − 46,339 = 23,059 ⟩ Subtract to find the difference
Stanley: 61,524 − 47,156 = 14,368

$$\begin{array}{r} 8,691 \end{array}$$

3. A company conducted a survey of 6,225 people to find out the fastest speed they have driven in certain cities. Based on the table below, what is the difference between sample's interquartile range and the population's interquartile range?

Name	Minimum	1st Quartile	2nd Quartile	3rd Quartile	Maximum
Atlanta	70	84	90	103	112
Athens	69	78	95	107	114
Chickamauga	75	80	86	97	105
Gray	75	87	86	109	119
Population	68	74	94	111	127

○ A. There is a difference of 19.6.

○ B. There is a difference of 12.25.

○ C. There is a difference of 15.25.

○ D. There is a difference of 18.25.

Handwritten work:

Find the Average Interquartile Range for the sample:

Atlanta: $103 - 84 = 19$
Athens: $107 - 78 = 29$
Chickamauga: $97 - 80 = 17$
Gray: $109 - 87 = 22$

Find the mean of sample:

$$\frac{19 + 29 + 17 + 22}{4}$$

$$\frac{87}{4} = 21.75$$

Interquartile Range of Population: $111 - 74 = 37$

Difference $37 - 21.75 = 15.25$

4. Mr. and Mrs. Nelson have decided they are going to send their son, Christopher, to a private high school. They will make their decision based on a rating system where 1 point is the lowest score a school can receive and 20 points is the highest. Below are the ratings received by the schools over a five-year period.

	2002	2003	2004	2005	2006
Sunlight Academy	12	11	14	13	10
Shadow Ridge Preparatory	17	14	11	12	16

Handwritten work:

$$\frac{12 + 11 + 14 + 13 + 10}{5} = 12$$

$$\frac{17 + 14 + 11 + 12 + 16}{5} = 14$$

$$\begin{array}{r} 14 \\ -12 \\ \hline 2 \end{array}$$

Based on the mean of the ratings, which school should the Nelsons choose and why? *(average of data (add and divide by the # of data terms))*

○ A. Sunlight Academy, because its mean rating is 2 points higher.

○ B. Shadow Ridge Preparatory, because its mean rating is 3 points higher.

○ C. Shadow Ridge Preparatory, because its mean rating is 2 points higher.

○ D. Sunlight Academy, because its mean rating is 3 points higher.

5. The school is conducting a survey to determine the relationship between the outside temperature and the number of students who eat lunch in the outside commons. The information is in the chart below.

| Temperature (°F)	Number of Students
57	44
65	92
66	361
57	176
73	124
71	361
91	294

What is the approximate mean of the temperatures? $\dfrac{57+65+66+57+73+71+91}{7} \approx 68.57$

↳average

- ○ A. 69.00°F
- ○ B. 70.50°F
- ○ C. 80.00°F
- ○ D. 68.57°F

6.

min. 1st median 3rd max.
46, 51, 54, 58, 64, 70, 74, 74, 69, 60, 52, 46

46, 46, 51, 52, 54, 58, 60, 64, 69, 70, 74, 74

Which of the box-and-whisker plots below represents the data set above?

the four dots represent the minimum, 1st quartile, median, 2nd quartile, and maximum values

W.   **X.**

Y.   **Z.**
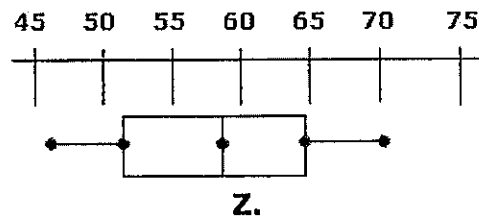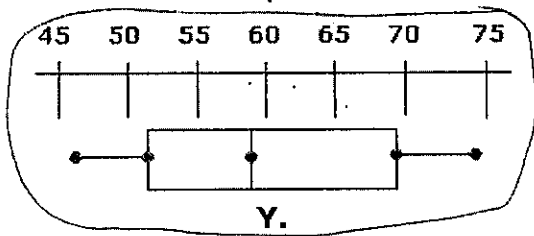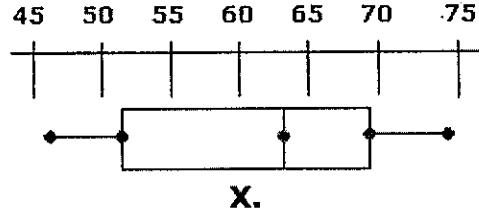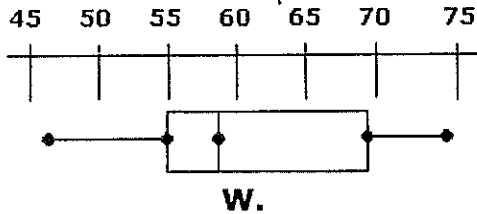
median: $\dfrac{58+60}{2} = 59$

1st quartile: $\dfrac{51+52}{2} = 51.5$

3rd quartile: $\dfrac{69+70}{2} = 69.5$

7. The following stem-and-leaf plot shows the number of people that attended the preseason basketball games.

```
 6|3 8
 7|2 3 5 5 6 8
 8|4 7 8
 9|6 6 7 8 9 ·
10|2 5 9
```
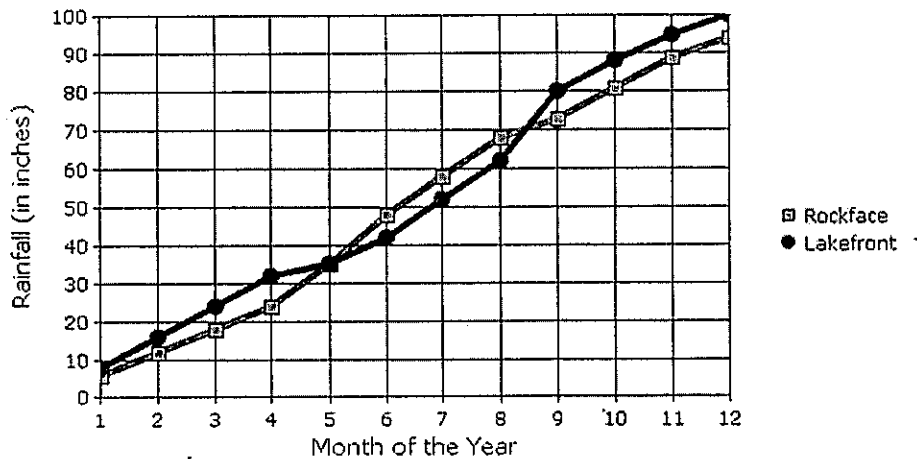
What is the mean of the data given above?

○ **A.** 87

○ **B.** 96.37

○ **C.** 91.17

○ **D.** 86.37

Handwritten: average $\frac{63+68+72+73+75+75+76+78+84+87+88+96+96+97+98+99+102+105+109}{19}$

$= 86.37$

8. The towns of Rockface and Lakefront have been tracking their annual rainfall. The average monthly rainfall for both towns over the previous year is shown in the following line graph.

Annual Rainfall

Rockface
Lakefront

Using the graph, predict during which of the following months Lakefront will have the greater cumulative rainfall for the year.

○ **A.** October
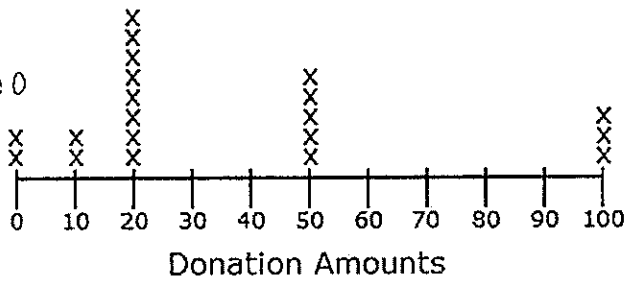
○ **B.** July

○ **C.** June

○ **D.** August

Handwritten: look at the graph for each answer choice to see which month Lakefront has a point higher than Rockface.

9. The following line plot shows the number of donations received during a charity drive. What is the median of the data in the graph?
(middle #)

This means:
2 people donated $0

Each X represents one donation.

$$\left(0, 0, \ 10, 10, \ 20, 20, \ 20, 20, 20, 20, 20, 20, \ 50, 50, 50, 50, 50, \ 100, 100, 100\right)$$

10 #s here

10 #s here

median = middle #

Average the two middle #s:
$$\frac{20 + 20}{2} = \frac{40}{2} = 20$$

O **A. $20.00**

O **B. $35.00**

O **C. $25.00**

O **D. $50.00**

10.

Summer Sales

May $5500 Sales
June $8000 sales
July $2500 Sales
August $7000 Sales
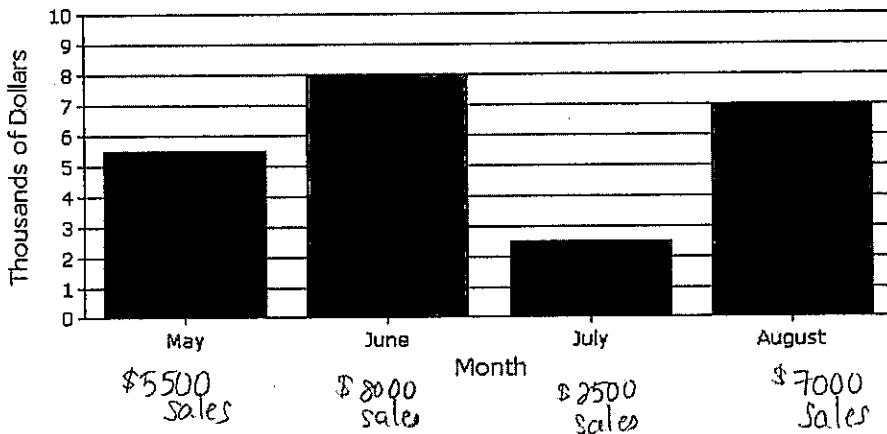
A company made a bar graph showing the amount of sales for each month in thousands of dollars. Which of the following is closest to the range of sales for the four-month period?

O **A. $2,500**

O **B. $1,500**

O **C. $5,500**

O **D. $3,000**

Range = Largest — Smallest

Range = 8000 — 2500

= 5500

11. When helping her little sister with her homework, Monique picked some products randomly from the multiplication chart. The products are represented by the box plot below.
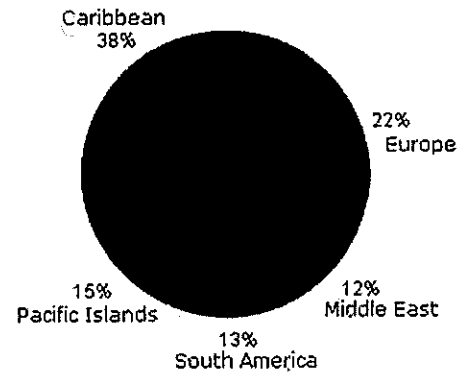
Multiplication Tables

25% 25% 25% 25%

50%

10   20   30   36   40   50
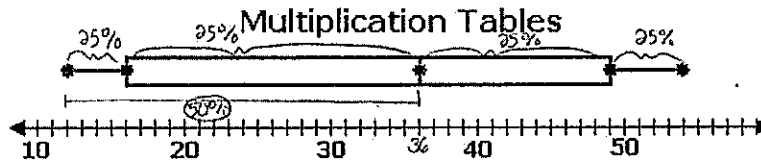
What percent of the data is below 36?

○ A. 25%
○ B. 50%
○ C. 75%
○ D. 36%

12. A travel agent made the given circle graph. The graph divides up the destinations that clients chose for the previous year into 5 categories. The agency is expecting to service 800 clients this year. Using the circle graph, predict the number of those clients who will choose the Caribbean as their vacation destination.

○ A. 304
○ B. 104
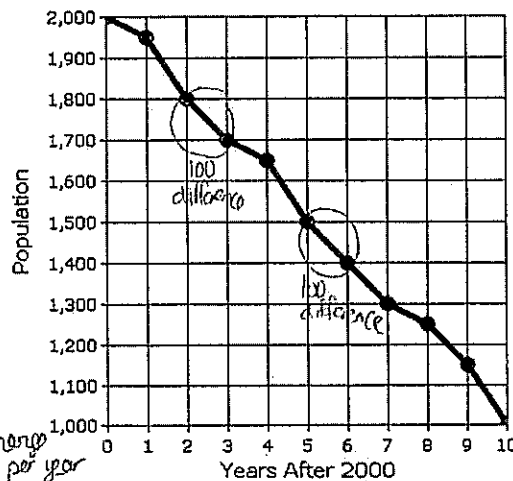○ C. 176
○ D. 120

38% of 800

$= (0.38)(800)$

$= 304$

Vacation Destinations

Caribbean 38%

22% Europe

12% Middle East

13% South America

15% Pacific Islands

13. The population of a certain species is declining rapidly. Use the graph to predict the population in 2015.

○ A. 500
○ B. 750
○ C. 875
○ D. 625

On average, the difference between 2 points is 100.

Each year, population will decrease by 100. In 5 years:

year 2010 population
         1000

5 yrs   Change per year

$- 5(100) = 1000 - 500 = \boxed{500}$ (2015 population)

Population of Species

2,000
1,900
1,800
1,700
1,600 100 difference
1,500
1,400
1,300
1,200
1,100
1,000

0 1 2 3 4 5 6 7 8 9 10
Years After 2000

Population

14. A group of band instructors answered a survey about hours of rehearsal per week and number of competitions won. The graph shows the results of this survey.

Based on these results, if a band practices 5 hours per week next season, which is the best estimate of the number of competitions the band can expect to win?

○ A. 27
○ B. 24
○ C. 38
○ D. 31

Draw line of best fit

Competitions Won

(5,31)

Hours Spent Rehearsing
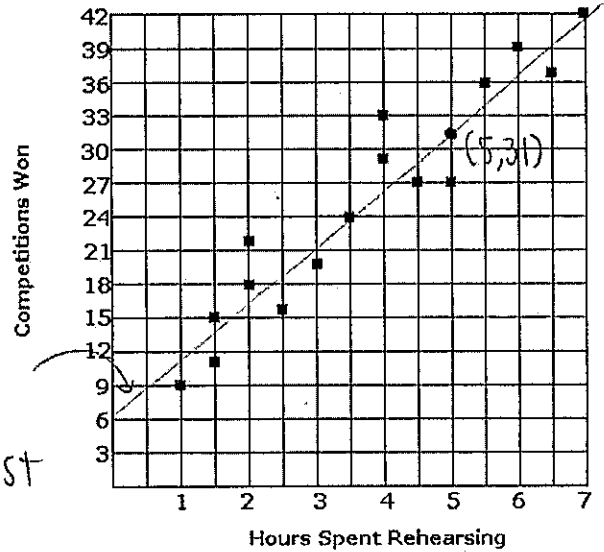
15. Kayla has a standard deck of 52 cards and a six-sided die. What is the probability that she will pull a diamond from the deck of cards and roll a 2?

○ A. $\frac{3}{26}$

○ B. $\frac{1}{4}$

○ C. $\frac{1}{24}$

○ D. $\frac{1}{6}$

Total Diamonds

$$\left(\frac{13}{52}\right)\left(\frac{1}{6}\right)$$

# of 2's on a 6-sided die

Total cards

Total # of outcomes on a 6-sided die

$$= \frac{13}{312} = \boxed{\frac{1}{24}}$$

16. Marli has one bag of different colored, same-size chips. There are 4 blue chips, 5 red chips, and 3 black chips. What is the probability that she will pull a blue chip and without replacement pull another blue chip?

○ A. $\frac{1}{3}$

○ B. $\frac{3}{11}$

○ C. $\frac{1}{11}$

○ D. $\frac{1}{4}$

$4+5+3 = 12$ total chips

Blue

$$\left(\frac{4}{12}\right)\left(\frac{3}{11}\right)$$

select one blue & remove it, so 3 left out of 11 total left
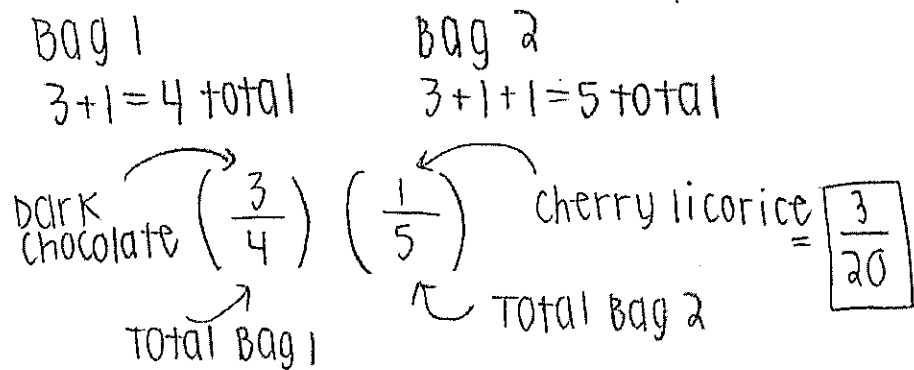
Total

$$= \frac{12}{132} = \boxed{\frac{1}{11}}$$

17. Katie is trick or treating. The man answering the door holds out two bags. In one bag, there are 3 bars of dark chocolate and 1 bar of white chocolate. In the other bag, there are 3 pieces of strawberry licorice, 1 piece of cherry licorice, and 1 piece of orange licorice. If Katie gets to randomly draw one piece of candy from each bag, what is the probability that she will get a bar of dark chocolate and a piece of cherry licorice?

○ A. $\frac{9}{20}$

○ B. $\frac{3}{20}$

○ C. $\frac{4}{9}$

○ D. $\frac{1}{20}$

Bag 1
3+1 = 4 total

Bag 2
3+1+1 = 5 total

Dark chocolate $\left(\frac{3}{4}\right)$ $\left(\frac{1}{5}\right)$ cherry licorice $= \frac{3}{20}$
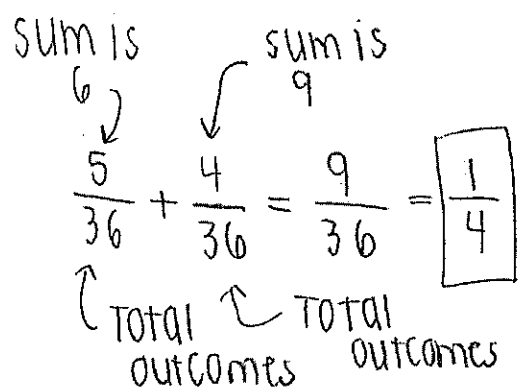
Total Bag 1   Total Bag 2

18. An experiment consists of rolling two fair dice and adding the dots on the two sides facing up. What is the probability that the sum of the dots is 6 or 9?

○ A. $\frac{1}{4}$

○ B. $\frac{2}{9}$

○ C. $\frac{1}{9}$

○ D. $\frac{1}{6}$

sum is 6   sum is 9

$\frac{5}{36} + \frac{4}{36} = \frac{9}{36} = \frac{1}{4}$

Total outcomes   Total outcomes

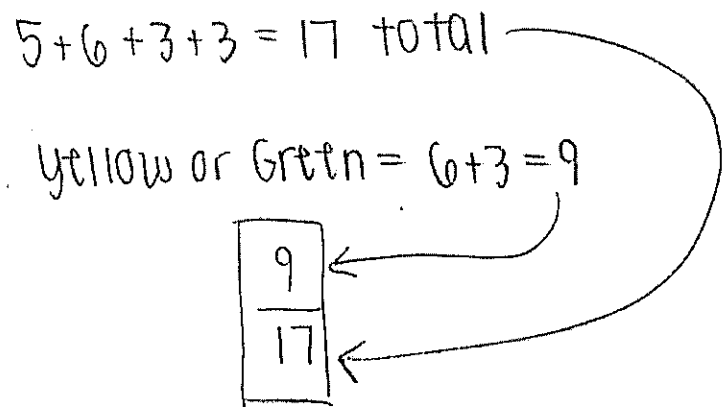|	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10
	6	7	8	9	10	11
	7	8	9	10	11	12

19. The following balls are placed in an urn: 5 red, 6 yellow, 3 blue, and 3 green. One ball is randomly drawn from the urn. What is the probability that the ball is either yellow or green?
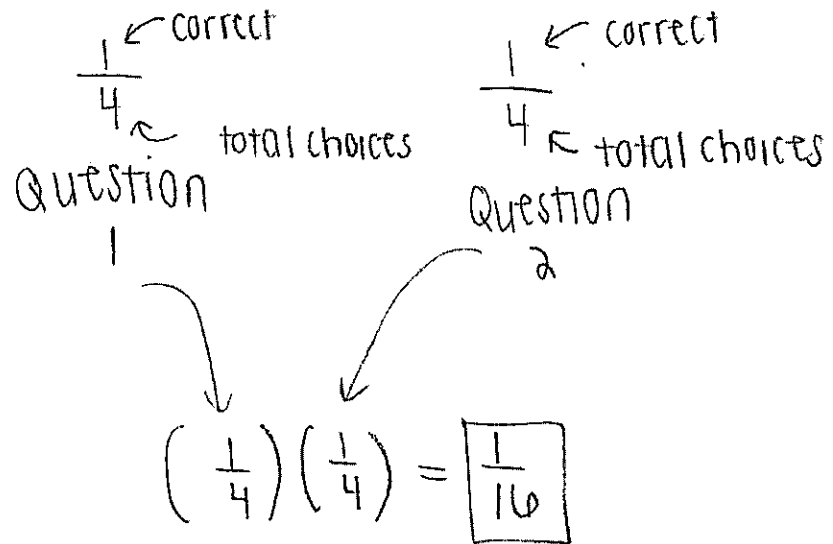
○ A. $\frac{9}{8}$

○ B. $\frac{2}{17}$

○ C. $\frac{1}{17}$

○ D. $\frac{9}{17}$

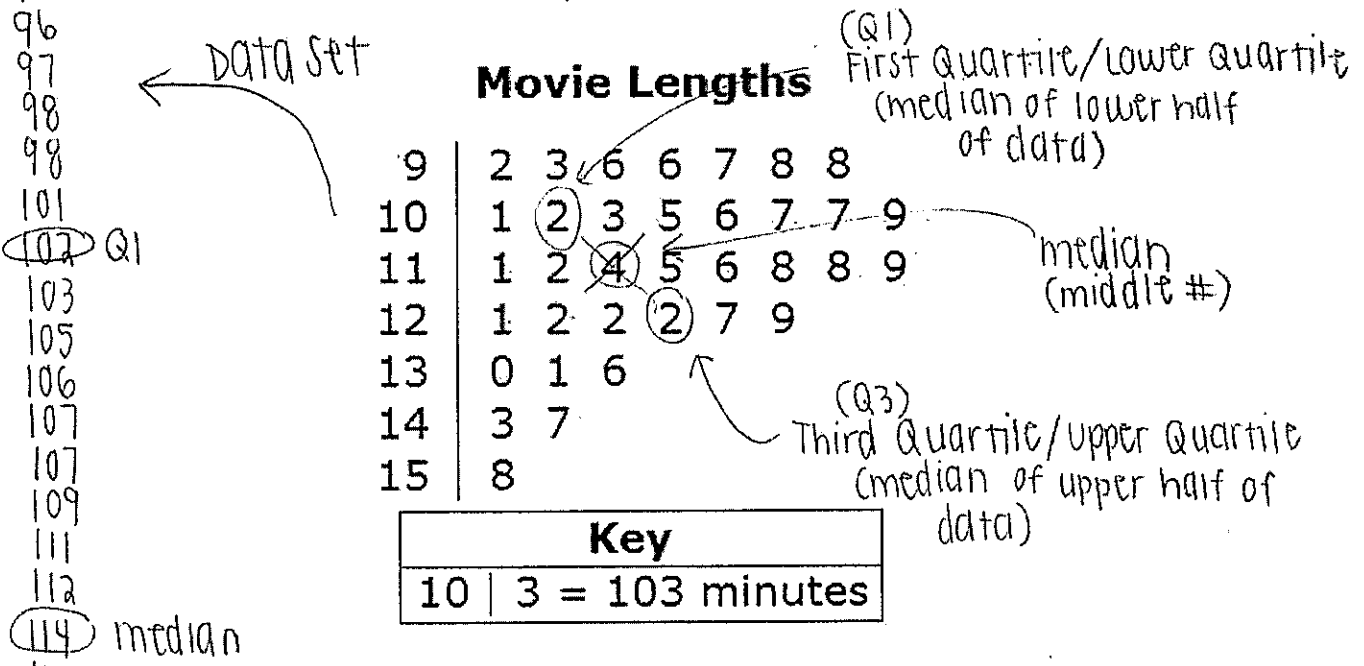5+6+3+3 = 17 total

yellow or Green = 6+3 = 9

$\frac{9}{17}$

20. Bobby is taking a multiple-choice history test. He has decided to randomly guess on the first two questions. On each question there are 4 answer choices. What is the probability that he answers the first question correctly and the second question correctly?

○ **A.** $\frac{1}{16}$

○ **B.** $\frac{3}{16}$

○ **C.** $\frac{9}{16}$

○ **D.** $\frac{1}{4}$

$\frac{1}{4}$ ← correct

← total choices

Question 1

$\frac{1}{4}$ ← correct

← total choices

Question 2

$$\left(\frac{1}{4}\right)\left(\frac{1}{4}\right) = \frac{1}{16}$$

21. OPEN-ENDED PROBLEM:

The lengths, in minutes, of the movies in Raul's DVD collection are shown in the stem-and-leaf plot below.

← data set

(Q1) First Quartile/Lower Quartile (median of lower half of data)

Movie Lengths

9	2 3 6 6 7 8 8
10	1 2 3 5 6 7 7 9
11	1 2 4 5 6 8 8 9
12	1 2 2 2 7 9
13	0 1 6
14	3 7
15	8

median (middle #)

(Q3) Third Quartile/Upper Quartile (median of upper half of data)

Key
10 | 3 = 103 minutes

A. What is the interquartile range of the movie lengths?

$$Q3 - Q1 = 122 - 102 = 20$$

interquartile range: ____20____ minutes

B. Raul wants to know the mean length of the shortest 25% of his movies. What is the mean length of the shortest 25% of the movies? mean of #'s up to to and including Q1

mean of the shortest 25%: ____97____ minutes

$$\frac{92+93+96+96+97+98+98+101+102}{9} = \frac{873}{9} = 97$$

C. Raul bought 4 new movies with lengths of 126, 116, 104, and 134 minutes. Find the new interquartile range and the new mean length of the shortest 25% of the movies.

```
 9 | 2 3 6 6 7 8 8                    Q1
10 | 1 2 ③ 4 5 6 7 7 9
11 | 1 2 4 ⑤ 6 6 8 8 9    median
12 | 1 2 2 2 ⑥ 7 9
13 | 0 1 4 6                 Q3
14 | 3 7
15 | 8
```

$$Q3 - Q1 = 126 - 103 = 23$$

Interquartile range: ___23___ minutes

mean of the shortest 25%: ___97.6___ minutes

$$\frac{92+93+96+96+97+98+98+101+102+103}{10} = \frac{976}{10} = 97.6$$