

ANSWERS

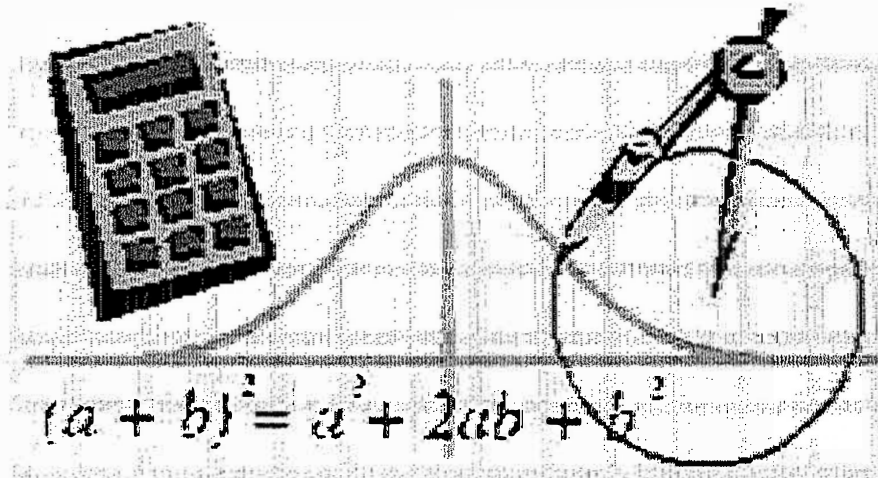
Downingtown High School

East/West

Keystone Algebra 1 Review

Module 2

Data Analysis



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	<i>mode = 30</i>
Store 2	79	59	67	89	68	79	79	67	85	91	<i>mode = 79</i>

79 - 30 = 49

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

- 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?

- 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.

range Michael range Stanley

$$69398 - 46339 = 23059$$

$$61524 - 47156 = 14368$$

— = 8691

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	1 st Quartile	2 nd Quartile	3 rd 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.

IQR

$$\left. \begin{array}{l} \text{Atlanta: } 103 - 84 = 19 \\ \text{Athens: } 107 - 78 = 29 \\ \text{Chickamauga: } 97 - 80 = 17 \\ \text{Gray: } 109 - 87 = 22 \\ \text{Pop: } 111 - 74 = 37 \end{array} \right\} \text{mean: } \frac{19 + 29 + 17 + 22}{4} \approx 21.75$$

$$37 - 21.75 \approx 15.25$$

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

$$\text{mean} = \frac{60}{5} = 12$$

$$\text{mean} = \frac{70}{5} = 14$$

Based on the mean of the ratings, which school should the Nelsons choose and why?

$$14 - 12 = 2$$

- 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

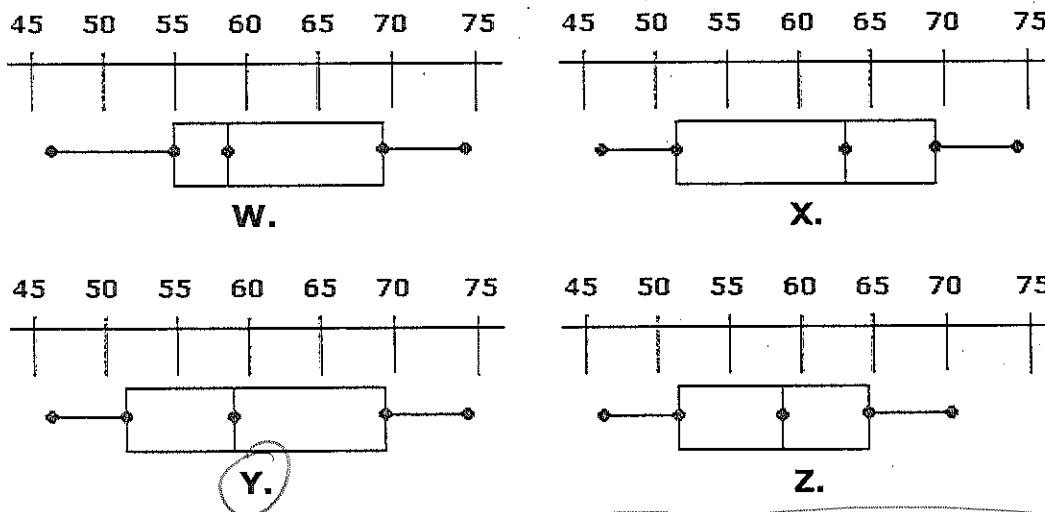
What is the approximate mean of the temperatures?

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

$$\frac{57 + 65 + 66 + 57 + 73 + 71 + 91}{7} \approx 68.57$$

6. 46, 51, 54, 58, 64, 70, 74, 74, 69, 60, 52, 46

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



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

$\frac{51+52}{2} \rightarrow 51.5$ (Q1)
 59 (med.)
 $\frac{69+70}{2} \rightarrow 69.5$ (Q3)

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

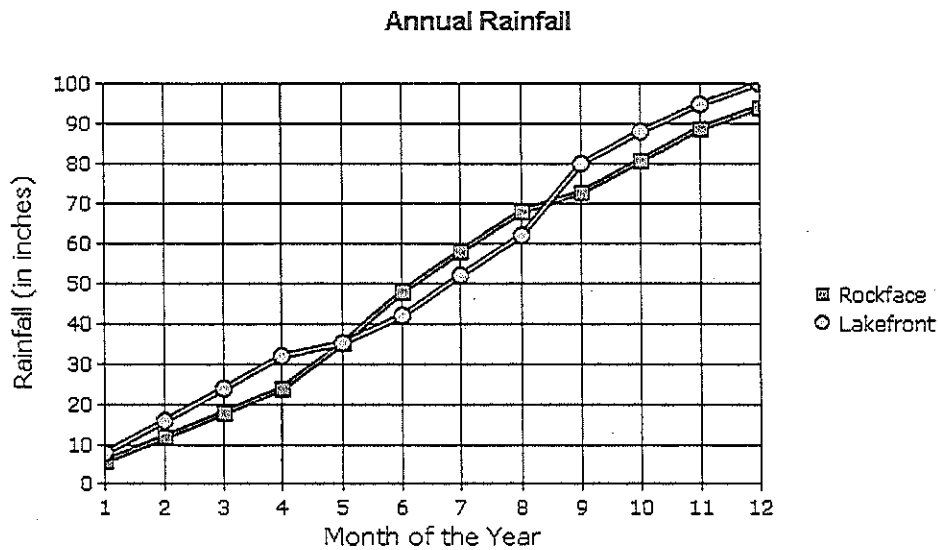
6	3 8
7	2 3 5 5 6 8
8	4 7 8
9	6 6 7 8 9
10	2 5 9

What is the mean of the data given above?

- A. 87
- B. 96.37
- C. 91.17
- D. 86.37**

$$\begin{array}{r}
 63 \ 68 \ 72 \ 73 \ 75 \ 75 \ 76 \ 78 \ 84 \ 87 \ 88 \ 96 \ 96 \ 97 \ 98 \ 99 \ 102 \ 105 \ 109 \\
 \hline
 19 \\
 \hline
 = 86.37
 \end{array}$$

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.



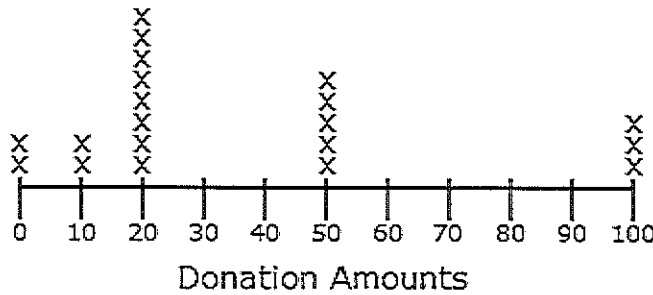
Using the graph, predict during which of the following months Lakefront will have the greater cumulative rainfall for the year.

- A. October**
- B. July
- C. June
- D. August

*look at 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 #



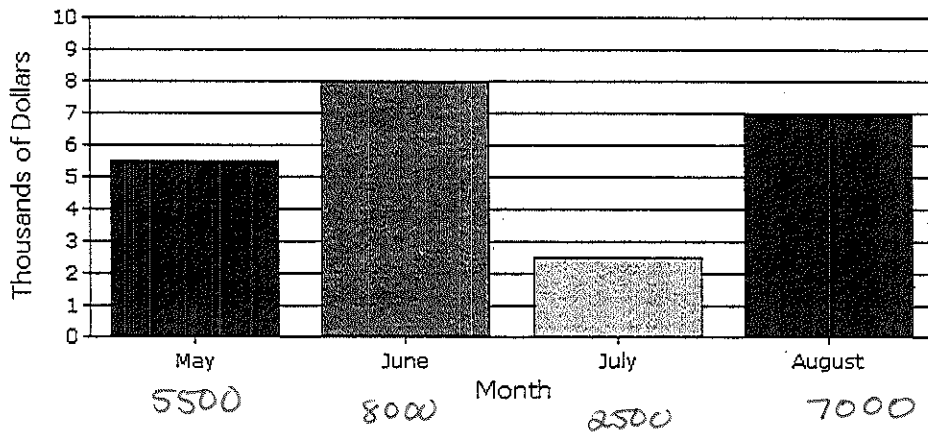
Each X represents one donation.

- A. \$20.00
- B. \$35.00
- C. \$25.00
- D. \$50.00

60 10 10 20 20 20 20 20 20 20 20 20 50 50 50 50 50 100 100 100
median = 20
20 #15

10.

Summer Sales

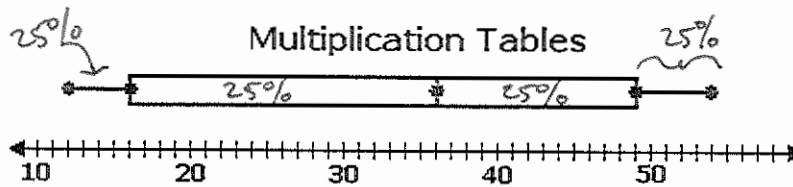


A company made a bar graph showing the amount of sales for each month in thousands of dollars. Which of the following is closest to the range of sales for the four-month period?

- A. \$2,500
- B. \$1,500
- C. \$5,500
- D. \$3,000

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.

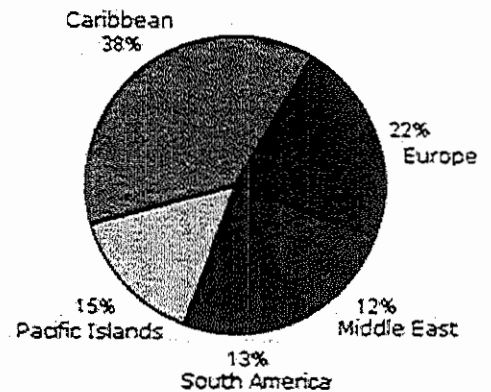


What percent of the data is below 36?

- 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.

Vacation Destinations



- A. 304**
- B. 104
- C. 176
- D. 120

$$\begin{aligned}
 &800 (38\%) \\
 &= (.38)(800) \\
 &= 304
 \end{aligned}$$

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

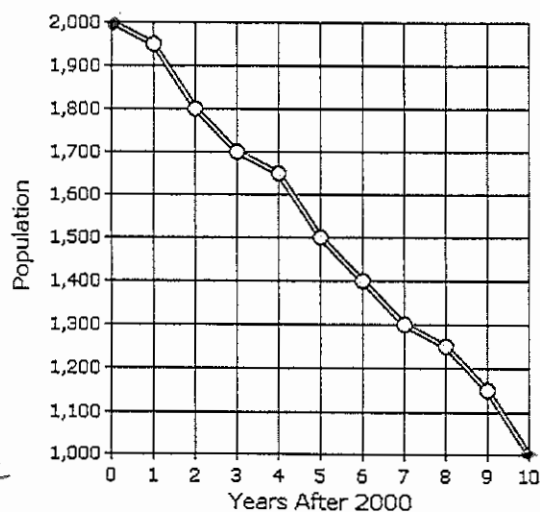
$$\begin{aligned}
 &(0, 2000) \\
 &(\frac{10}{1000}, 1000) \\
 &\frac{2000 - 1000}{0 - 10} = \frac{1000}{-10} =
 \end{aligned}$$

- 100

so each year population decrease by 100 on average.

so pop. in 2010 is 1000
 in 5 years (100) = 500, so 1000 - 500 = 500
 (2015)

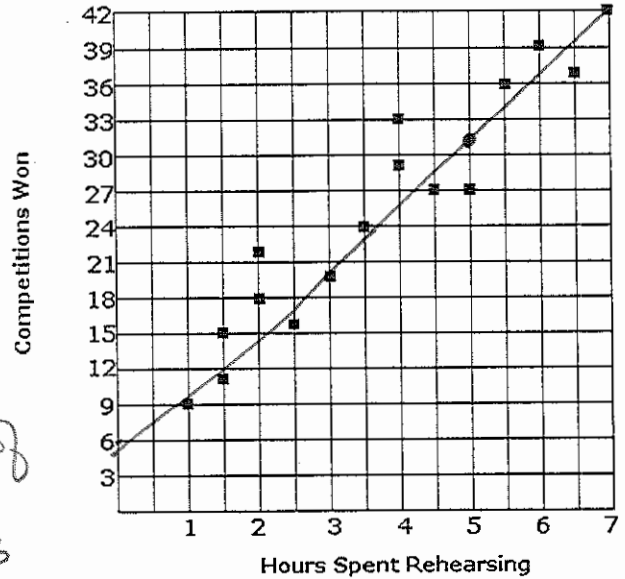
Population of Species



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 where line hits 5 hours is ≈ 31

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. $\frac{1}{6}$

$$\frac{\text{total diamonds}}{\text{total cards}} = \frac{13}{52} \cdot \frac{1}{6} = \frac{\text{total \# of 2's}}{\text{total choices}} = \frac{13}{312} = \frac{1}{24}$$

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. $\frac{1}{4}$

$$4 + 5 + 3 = 12$$

$$\frac{4}{12} \cdot \frac{3}{11} = \frac{12}{132} = \frac{1}{11}$$

Blue → $\frac{4}{12}$

Total → $\frac{3}{11}$

1 less blue

1 less than total

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
 $3+1=4$
 dark + white

Bag 2
 $3+1+1=5$
~~straw~~ Lic. + cherry + orange

$$\frac{3}{4} \cdot \frac{1}{5} = \frac{3}{20}$$

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. $\frac{1}{6}$

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

6's 9's

						
	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

36 TOTAL

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. $\frac{9}{17}$

$$5+6+3+3=17$$

r y b g

$$\frac{6+3}{17} = \frac{9}{17}$$

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. $\frac{1}{4}$

$\frac{1 \text{ Correct}}{4 \text{ total}}$

Question 1

Question 2

$\frac{1}{4}$

$\frac{1}{4} = \frac{1}{16}$

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.

92
93
96
96
97
98
98
101
102
103
105
106
107
107
109
111
112
114
115
116
118
118
119
121
122
122
122
127
129
130
131
136
143
147
158

Q1

Q2 = med

Q3

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

7
+8
+8
+6
+3
+2
+1

35 #'s
so middle #
is 18th #

Key	
10 3	= 103 minutes

A. What is the interquartile range of the movie lengths?
 $122 - 102 =$
 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 + 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	$\rightarrow Q1 = 103$
10	1 2 (3) 4 5 6 7 7 9	
11	1 2 4 (5) 6 6 8 8 9	
12	1 2 2 2 (6) 7 9	
13	0 1 4 6	$\leftarrow Q3 = 126$
14	3 7	
15	8	

There were 35 #'s
 + we add 4 more
 so there are 39
 $Q2 = 20^{\text{th}}$ #, so 115

$$126 - 103 = 23$$

interquartile range: 23 minutes

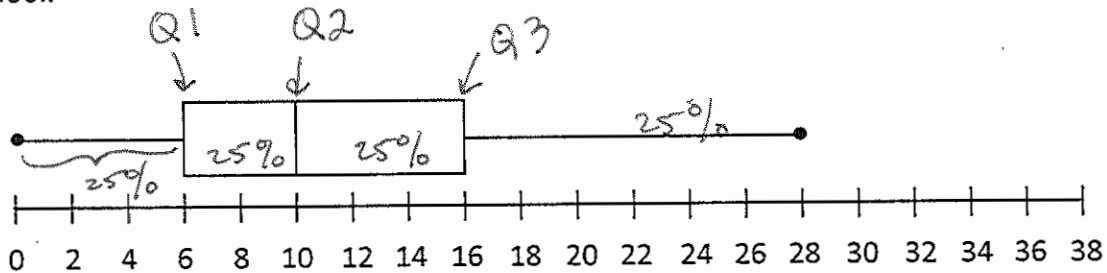
mean of the shortest 25%: _____ minutes

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

Constructed Response Review – Data Analysis

Read the problem. Write your answer for each part.

1. The box-and-whisker plot below represents the number of days students were absent from school.



A. What is the range of the scores?

$$28 - 0 = 28$$

B. What is the interquartile range?

$$16 - 6 = 10$$

C. If the plot represents 84 students, about how many were absent for more than 16 days?

$$\begin{aligned} 75\% \text{ are } > 16 \\ \text{so } (84)(.25) &= 21 \end{aligned}$$

D. Explain how you know that half of the class missed at most 10 days.

$$\text{med} = Q2 = 10$$

Constructed Response Review – Data Analysis

Read the problem. Write your answer for each part.

2. Chase's test scores for the 3rd marking period are shown below. His mean score after all five tests was 81.

Test	1	2	3	4	5
Score	80	76	92	84	?

A. What was Chase's score for the 5th test?

(73)

$$\frac{80 + 76 + 92 + 84 + X}{5} = 81$$

$$\frac{332 + X}{5} = 81.5$$

$$332 + X = 81.5 \cdot 5$$

$$332 + X = 405$$

$$X = 73$$

B. What was Chase's median score for the 5 tests?

73 76 (80) 84 92

C. Chase took a sixth test and his median score changed to 79. What was his score on the sixth test?

median changed from 80 to 79 so new score is less than 80 but since median is 79 it's close to 80. since there's now an even # of #'s, we'll add new score to 80 then divide by 2.

D. Explain how you know your answer is correct in Part C.

new score is 78

$$\frac{X + 80}{2} = 79$$

$$2 \cdot \frac{X + 80}{2} = 79 \cdot 2$$

$$X + 80 = 158$$

$$\begin{array}{r} X + 80 = 158 \\ -80 \quad -80 \\ \hline X = 78 \end{array}$$