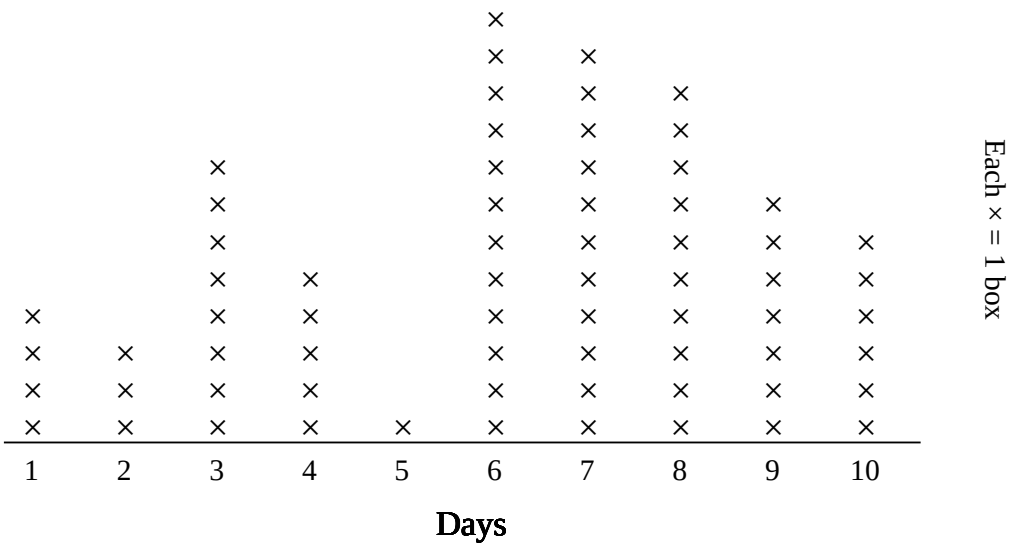
Tom was selling boxes of chocolate candy for his school's fundraiser. He plotted the number of boxes he sold in the line plot below. Use his line plot to answer the questions.



1) How many boxes did he sell on day 8?

2) Did he sell more boxes on day 7 or day 2?

3) Did he sell fewer boxes on day 9 or day 6?

4) How many days did he sell more than 3 boxes?

5) How many days did he sell fewer than 7 boxes?

6) What is the combined amount of boxes he sold on day 3 and on day 10?

7) He sold the greatest number of boxes on which day?

8) He sold the least amount of chocolate on which day?

9) Which days (if any) did he sell more than 8 boxes?

10) What is the difference in the number of boxes he sold on day 7 and the number he sold on day 5?

11) Which day did he sell exactly 8 boxes?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

1-10	91	82	73	64	55	45	36	27	18	9
11	0									

English Spanish

7.2 Lesson

Check It Out
Lesson Tutorials
BigIdeasMath.com

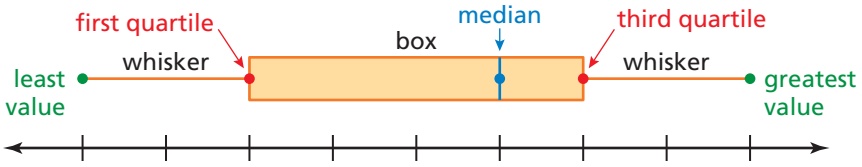
Key Vocabulary
box-and-whisker plot, *p. 282*
quartiles, *p. 282*

Study Tip
A box-and-whisker plot shows the *variability* of a data set.

Key Idea

Box-and-Whisker Plot

A **box-and-whisker plot** displays a data set along a number line using medians. **Quartiles** divide the data set into four equal parts. The median (second quartile) divides the data set into two halves. The median of the lower half is the first quartile. The median of the upper half is the third quartile.

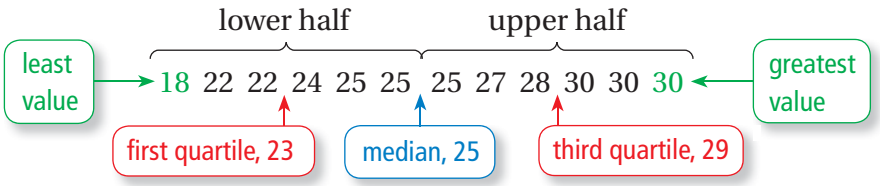


EXAMPLE 1 Making a Box-and-Whisker Plot

Make a box-and-whisker plot for the ages of the members of the 2008 U.S. women's wheelchair basketball team.

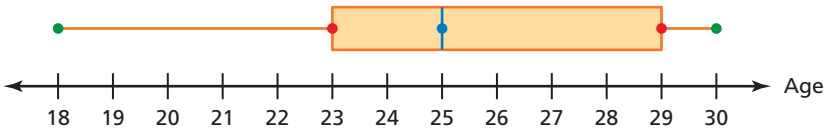
24, 30, 30, 22, 25, 22, 18, 25, 28, 30, 25, 27

Step 1: Order the data. Find the median and the quartiles.



Step 2: Draw a number line that includes the least and greatest values. Graph points above the number line for the least value, greatest value, median, first quartile, and third quartile.

Step 3: Draw a box using the quartiles. Draw a line through the median. Draw whiskers from the box to the least and greatest values.



On Your Own

Now You're Ready
Exercises 5–7

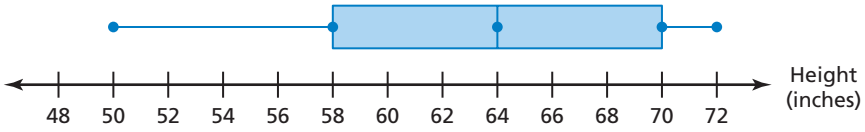
1. A basketball player scores 14, 16, 20, 5, 22, 30, 16, and 28 points during a tournament. Make a box-and-whisker plot for the points scored by the player.

Multi-Language Glossary at BigIdeasMath.com

English Spanish

EXAMPLE 2 Interpreting a Box-and-Whisker Plot

What does the box-and-whisker plot tell you about the data?



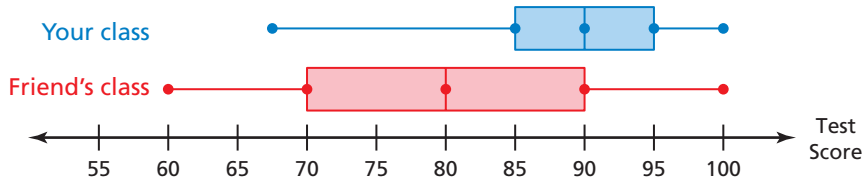
Study Tip

A long whisker or box indicates data is more spread out.

- The left whisker is longer than the right whisker. So, the data are more spread out below the first quartile than above the third quartile.
- The range of the data is $72 - 50 = 22$ inches.

EXAMPLE 3 Standardized Test Practice

Which statement is true about the double box-and-whisker plot?



(A) Half of the test scores in your class are between 85 and 100.

(B) 25% of the test scores in your friend's class are 80 or above.

(C) The medians are the same for both classes.

(D) The test scores in your friend's class are more spread out than the test scores in your class.

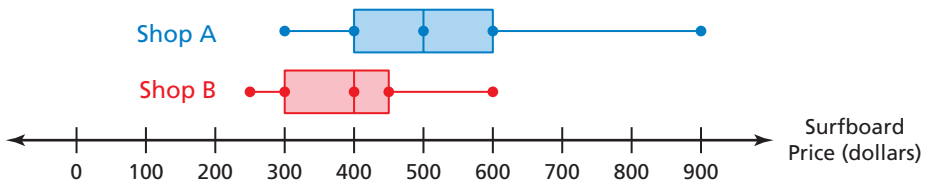
The range of the test scores in your class is less than the range in your friend's class. Also, the box for your friend's class is longer than the box for your class. So, the test scores in your friend's class are more spread out than the test scores in your class.

∴ The correct answer is (D).

On Your Own

Now You're Ready
Exercise 10

2. Compare the surfboard prices of Shop A and Shop B. What are three conclusions you can make from the double box-and-whisker plot?



Corbett maths

Box Plots

Videos 149 and 150 on www.corbettmaths.com

Workout

Question 1: Draw a box plot for each of the following.

(a)

Lowest Value	2
Lower Quartile	7
Median	9
Upper Quartile	10
Highest Value	13

(b)

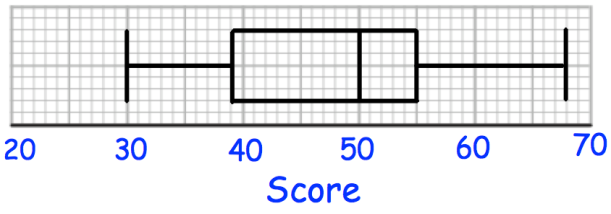
Lowest Value	23
Lower Quartile	30
Median	32
Upper Quartile	34
Highest Value	45

(c)

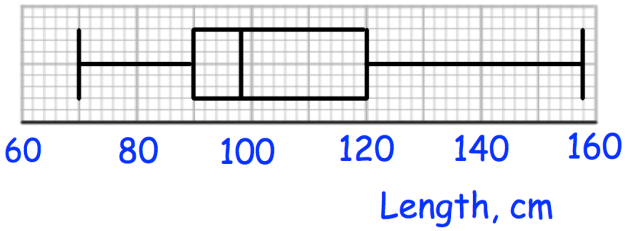
Lowest Value	60
Lower Quartile	85
Median	100
Upper Quartile	110
Highest Value	170

Question 2: For each box plot below, find the (i) median, (ii) interquartile range, (iii) range

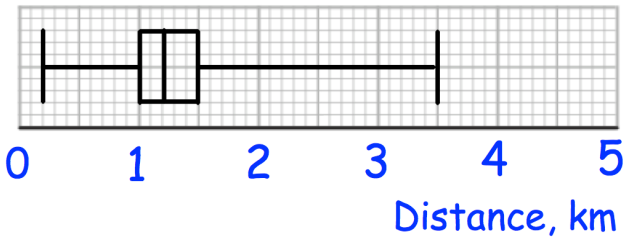
(a)



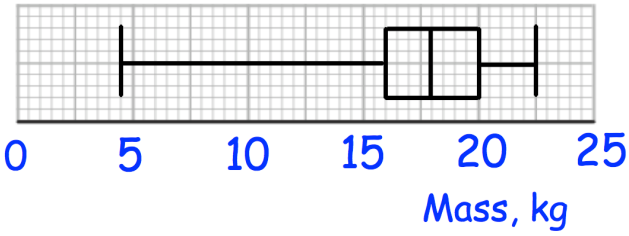
(b)



(c)



(d)



Question 3: Draw a box plot for each of the following.

(a)

Lower Quartile	3.4
Median	3.9
Upper Quartile	4.1
Highest Value	5.4
Range	3.7

(b)

Lowest Value	6
Median	14
Upper Quartile	16
Range	20
Interquartile Range	5

(c)

Lower Quartile	115
Median	135
Highest Value	160
Range	70
Interquartile Range	25

Box Plots

Videos 149 and 150 on www.corbettmaths.com

Question 4: Draw a box plot for each set of data

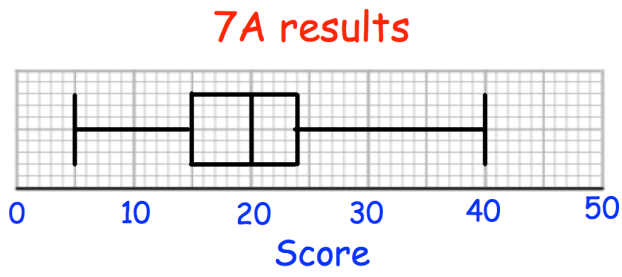
(a) 8, 10, 13, 14, 14, 15, 15, 16, 18, 19, 21, 22, 24, 29, 35

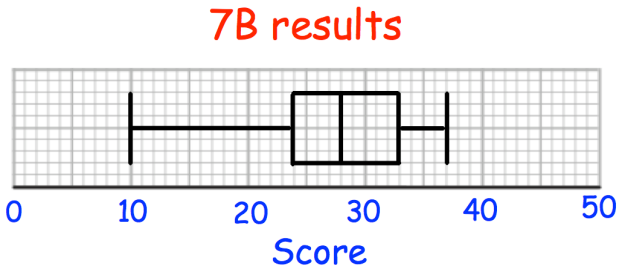
(b) 40, 80, 90, 90, 100, 120, 130

(c) 5.9, 7.3, 7.8, 8, 8.4, 8.7, 8.9, 8.9, 8.9, 9, 9, 9.1, 9.1, 9.3, 9.5, 9.6, 9.9, 10.5, 10.9

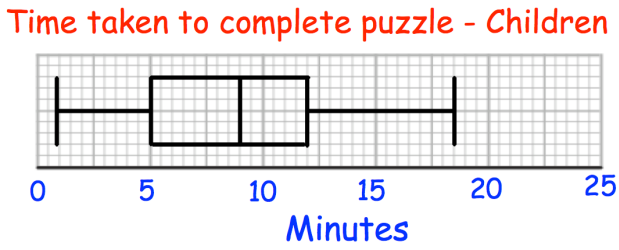
Question 5: Compare the distributions of each pair of box plots below.

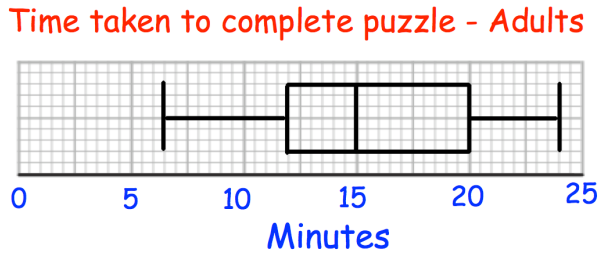
(a)



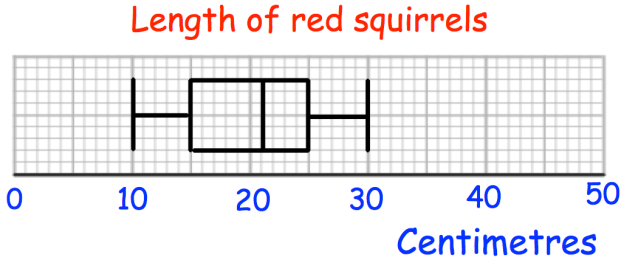


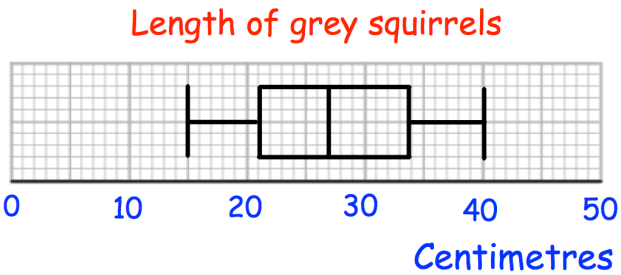
(b)



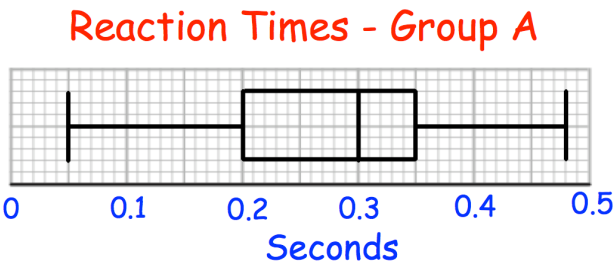


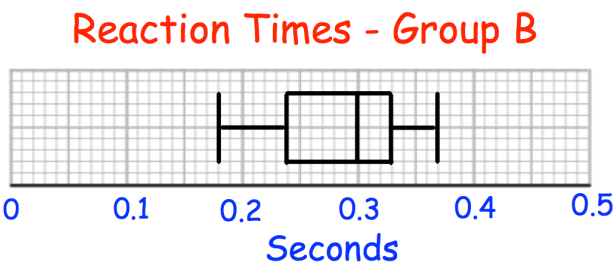
(c)





(d)





Box Plots

Videos 149 and 150 on www.corbettmaths.com

Apply

Question 1: Gareth and Wayne are two footballers.
The table shows information about the number of passes they make in each game over a season.

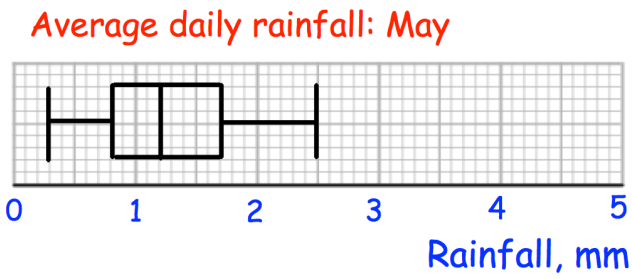
	Gareth	Wayne
Lowest Value	5	2
Lower Quartile	12	11
Median	16	19
Upper Quartile	24	
Highest Value		57
Interquartile Range		25
Range	38	

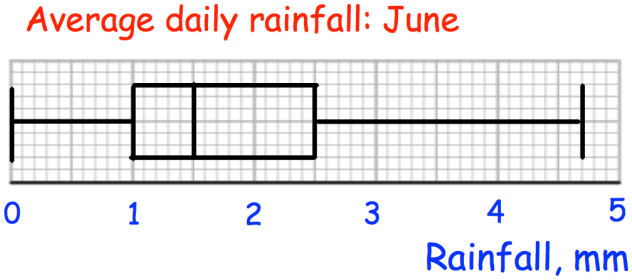
(a) Find the missing values from the table

(b) Using the same scale, draw box plots to represent the data.

(c) Compare and contrast the two box plots

Question 2: Rosie is going on holiday to an island.
The box plots below show information about the daily average rainfall in May and June on the island.





(a) What was the median rainfall in May?

(b) What was the highest rainfall in June?

(c) What percentage of days in June had over 2.5mm of rain?

(d) What percentage of days in May had over 2.5mm of rain?

(e) What percentage of days in May had under 1.2mm of rain?

(f) When would you recommend Rosie visits the island?
Explain your answer.

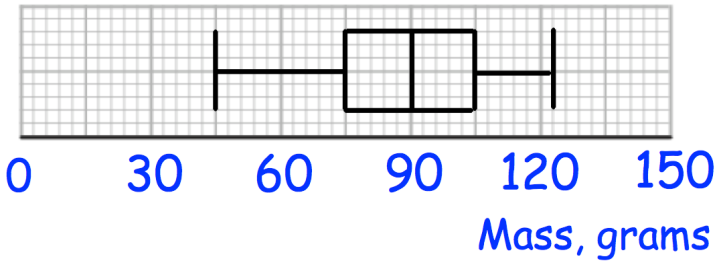
Box Plots

Videos 149 and 150 on www.corbettmaths.com

Question 3: Mr Jones is an estate agent on the Isle of Man.
He has created this table to show information about the prices of houses he has sold.
Explain how you know he has made a mistake.

Median	£375,000
Range	£235,000
Interquartile Range	£590,000

Question 4: The box plot show information about the masses of apples in a crate.



Jack is going to select apples at random from the crate.
After selecting each apple, he records its mass and returns it to the crate before picking another.
Work out the probability that:

(a) Jack picks two apples, both under 75g

(b) Jack picks two apples, both over 90g

(c) Jack picks two apples, both over 105g

(d) Jack picks two apples, one under 90g and one over 105g

(e) Jack picks three apples, all over 105g

(f) Jack picks three apples, two over 105g and one under 75g.

Name : _____ Score : _____

Box-and-Whisker Plot

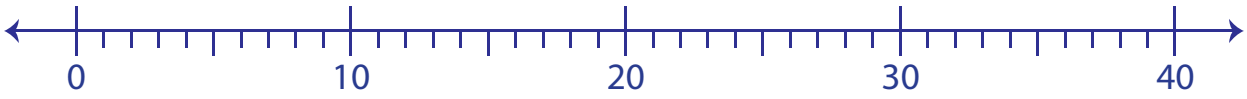
Level 1: S1

Make box-and-whisker plots for the given data.

1) 17, 29, 32, 9, 30, 14, 8, 39, 11, 32, 23

Minimum : _____ Maximum : _____

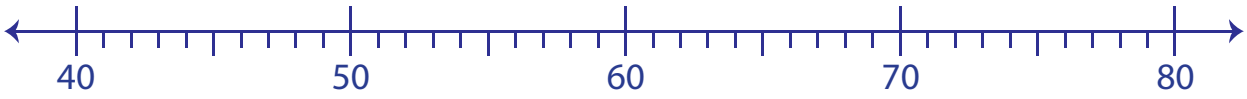
Q_1 : _____ Q_2 : _____ Q_3 : _____



2) 58, 67, 44, 72, 51, 42, 60, 46, 69

Minimum : _____ Maximum : _____

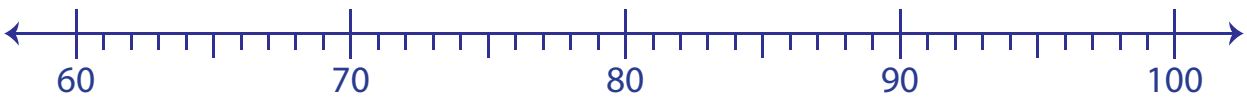
Q_1 : _____ Q_2 : _____ Q_3 : _____



3) 67, 100, 94, 77, 80, 62, 79, 68, 95, 86, 73, 84

Minimum : _____ Maximum : _____

Q_1 : _____ Q_2 : _____ Q_3 : _____



Name : _____ Score : _____

Box-and-Whisker Plot

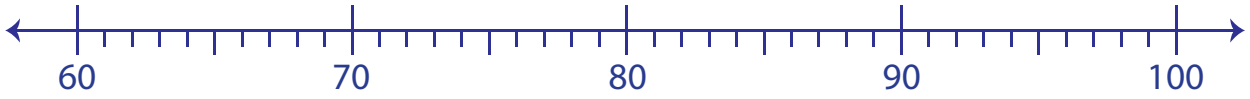
Sheet 1

1) The teacher recorded the math scores of top ten students in grade V. Their scores are as follows.

86, 92, 75, 81, 93, 99, 89, 90, 84, 93

Make a box-and-whisker plot.

Min : _____, Q_1 : _____, Q_2 : _____, Q_3 : _____, Max : _____

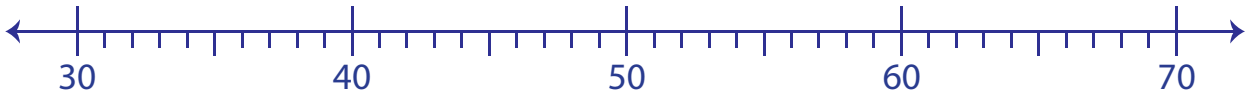


2) Eleven staff from a university visited a museum. The below given data shows their ages noted by a volunteer of the museum to issue tickets.

42, 46, 50, 52, 53, 50, 51, 38, 48, 47, 43

Make a box-and-whisker plot.

Min : _____, Q_1 : _____, Q_2 : _____, Q_3 : _____, Max : _____

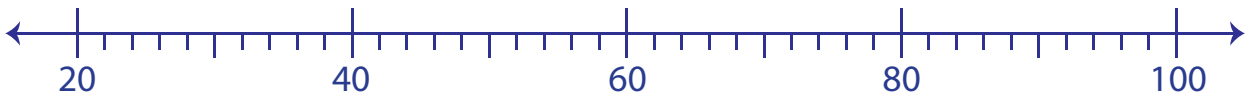


3) The figures shown below are the sales of twelve vegetables (in pounds) at a supermarket in a day.

24, 34, 98, 44, 72, 56, 52, 50, 38, 22, 20, 60

Make a box-and-whisker plot.

Min : _____, Q_1 : _____, Q_2 : _____, Q_3 : _____, Max : _____

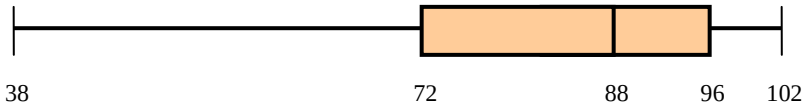


Name _____ Period _____

Interpreting a Box & Whisker Plot

For questions 1 – 5, refer to the box & whisker graph below which shows the test results of a math class.

Test Scores (as %) for 9th Period



_____ 1. What was the high score on the test?

_____ 2. What percent of the class scored above a 72?

_____ 3. What was the median score on the test?

_____ 4. What percent of the class scored between 88 & 96?

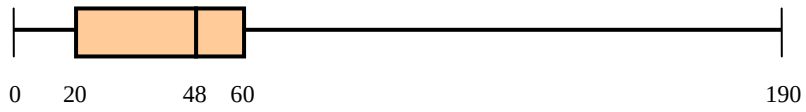
5. Do you think that this test was too hard for the students? Explain.

_____

_____

For questions 7 – 10 refer to the box & whisker graph below that shows how much time was spent per night on homework for sophomore class at a certain high school during September.

Average Minutes Per Night Spent On Homework



_____ 7. What percent of the sophomores spend more than 60 minutes on homework per night?

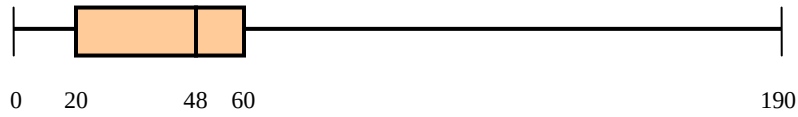
_____ 8. What is the range of times that the middle 50% of the sophomores spend on homework per night?

_____ 9. How many sophomores do not do homework?

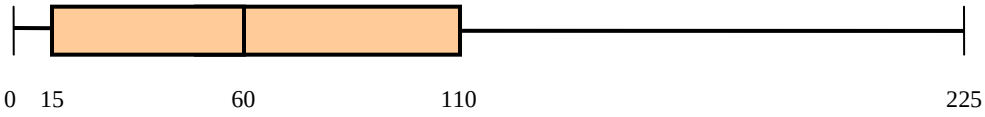
_____ 10. What percent of the sophomores spend less than 20 minutes per night on homework?

For questions 12 – 23, refer to the box & whisker graphs below that compare homework time per night with TV time per night for the same group of sophomores.

TV & Homework Minutes per Night



Homework Time



TV Time

_____ 12. What percent of the sophomores watch TV for at least 15 minutes per night?

_____ 13. What is the 3rd quartile for the TV time data?

14. Is it more common for a sophomore at this high school to spend more than 1 hour on homework or more than 1 hour watching TV? Explain.

_____

_____

_____

For questions 15 – 23, identify if each statement is true, false, or cannot be determined.

_____ 15. Some sophomores didn't watch TV that month.

_____ 16. The TV box & whisker graph contains more data than the homework graph.

_____ 17. 25% of the sophomores spend between 48 & 60 minutes per night on homework.

_____ 18. 15% of the sophomores didn't watch TV that month.

_____ 19. In general, these sophomores spend more time watching TV than doing homework.

_____ 20. The TV data is more varied than the homework data.

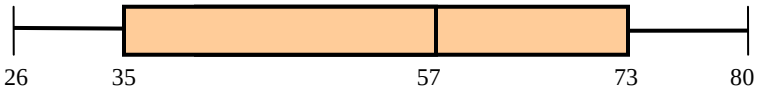
_____ 21. The ratio of sophomores who spend more than 110 minutes per night watching TV to those who spend less is about 2:1.

_____ 22. 225 sophomores watch TV.

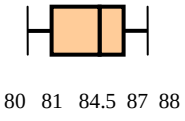
_____ 23. Twice as many sophomores watch TV for more than 1 hour than do homework for more than 1 hour.

For question 25, refer to the box & whisker graphs below that show the average monthly high temperatures for Milwaukee, Wisconsin & Honolulu, Hawaii.

Average Monthly High Temperatures



Milwaukee



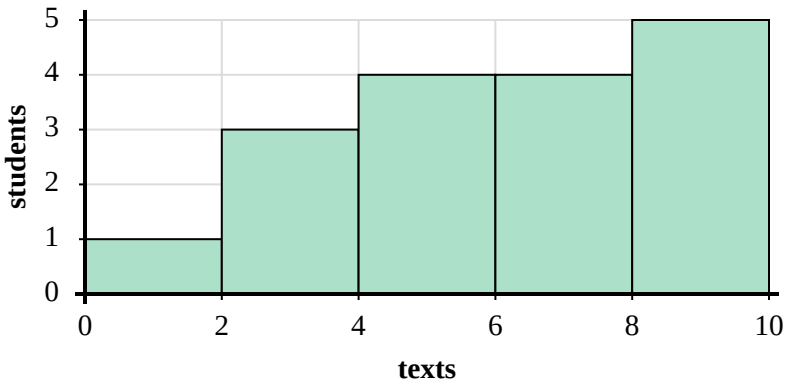
Honolulu

25. Complete the table using the box and whisker plots for Honolulu and Milwaukee.

	Milwaukee	Honolulu
Median		
Minimum		
Maximum		
Lower quartile		
Upper quartile		
Interquartile range		

Interpreting Histograms Name:

The histogram below show the number of texts students sent each day.



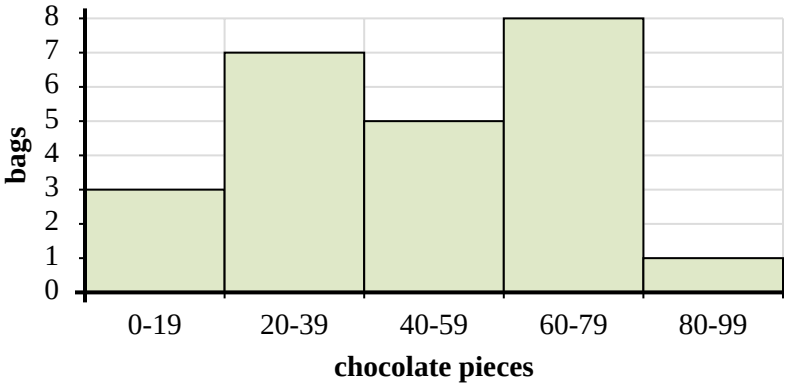
1) Most students sent between ___ and ___ texts.

2) How many students sent between 8 and 10 texts?

3) How many students are represented in this histogram?

4) If a student sent 2 texts which bar would they be added to?

The histogram below show the quantity of chocolate pieces per bag of trail mix.



5) Most bags had between ___ and ___ pieces of chocolate.

6) How many bags had between 60 and 79 chocolate pieces?

7) How many bags of trail mix are represented in this histogram?

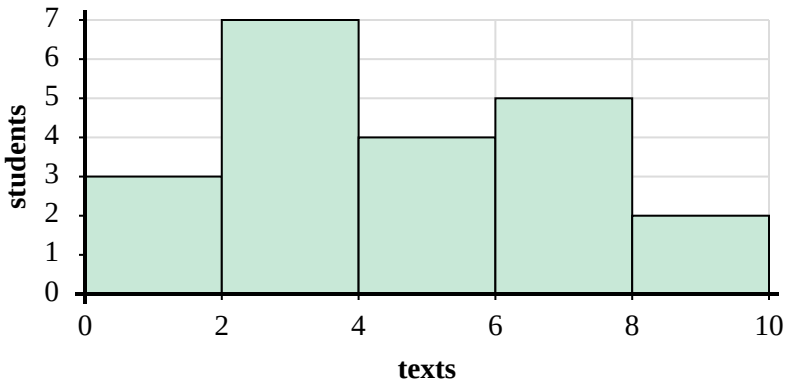
8) If a bag had 59 pieces of chocolate in it, which bar would it be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the number of texts students sent each day.



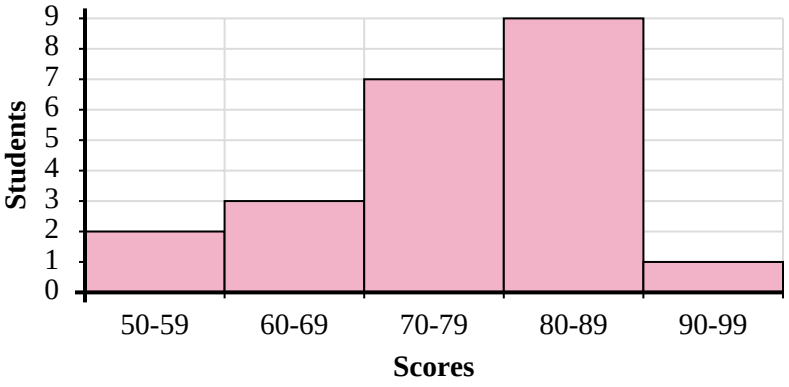
1) Most students sent between ___ and ___ texts.

2) How many students sent between 2 and 4 texts?

3) How many students are represented in this histogram?

4) If a student sent 2 texts which bar would they be added to?

The histogram below show the students scores for a quiz.



5) Most students scored between a ___ and ___.

6) How many students scored between a 80 and 89?

7) How many students are represented in this histogram?

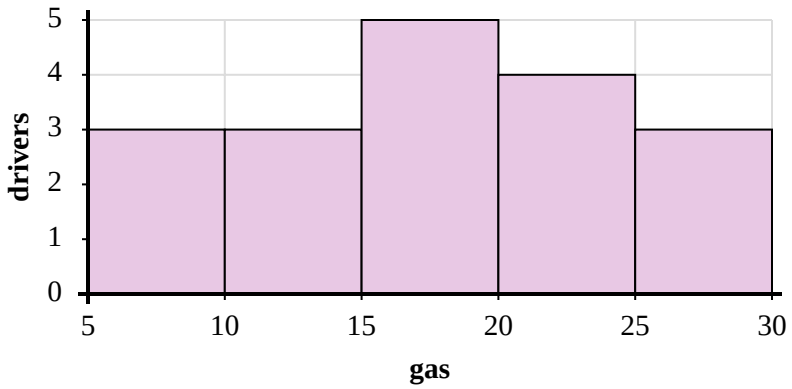
8) If a student scored a 59 which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the gallons of gas drivers purchased each week.



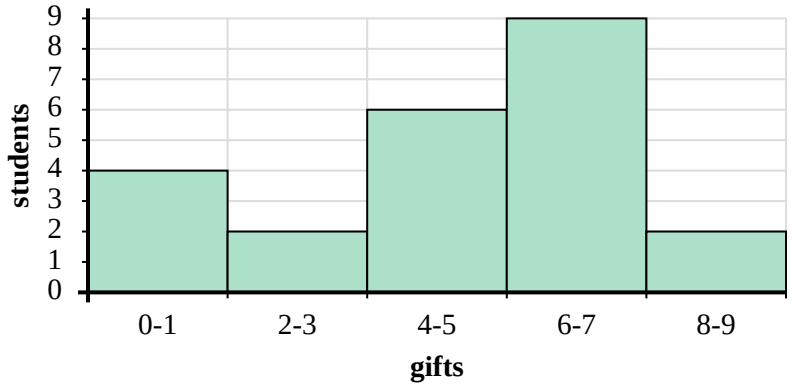
1) Most drivers purchased between ___ and ___ gallons.

2) How many drivers purchased between 5 and 10 gallons?

3) How many drivers are represented in this histogram?

4) If a driver purchased 15 gallons which bar would they be added to?

The histogram below show the number of gifts students received for their birthday.



5) Most students received between ___ and ___ gifts.

6) How many students received between 6 and 7 gifts?

7) How many students are represented in this histogram?

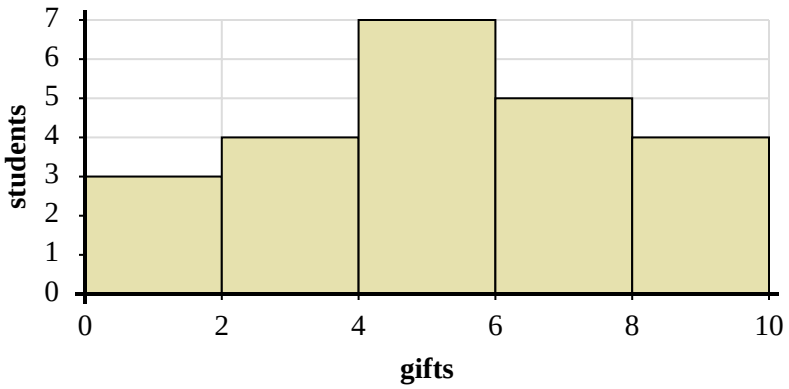
8) If a student received 3 gifts which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the number of gifts students received for their birthday.



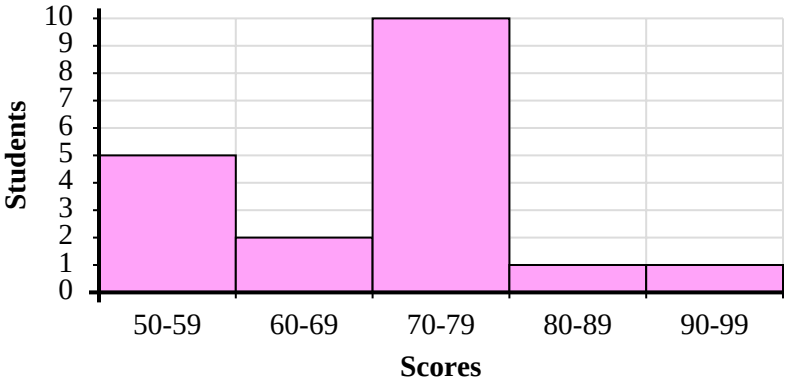
1) Most students received between ___ and ___ gifts.

2) How many students received between 8 and 10 gifts?

3) How many students are represented in this histogram?

4) If a student received 6 gifts which bar would they be added to?

The histogram below show the students scores for a quiz.



5) Most students scored between a ___ and ___.

6) How many students scored between a 70 and 79?

7) How many students are represented in this histogram?

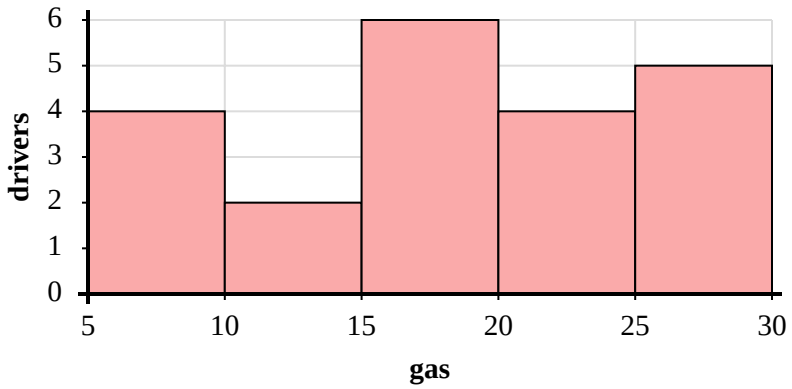
8) If a student scored a 89 which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the gallons of gas drivers purchased each week.



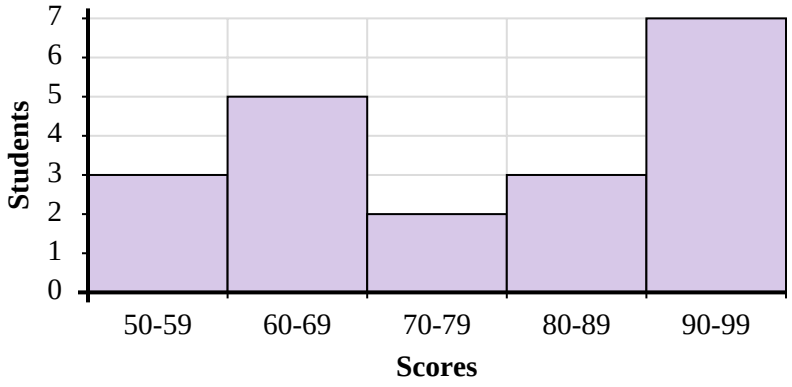
1) Most drivers purchased between ___ and ___ gallons.

2) How many drivers purchased between 10 and 15 gallons?

3) How many drivers are represented in this histogram?

4) If a driver purchased 15 gallons which bar would they be added to?

The histogram below show the students scores for a quiz.



5) Most students scored between a ___ and ___.

6) How many students scored between a 60 and 69?

7) How many students are represented in this histogram?

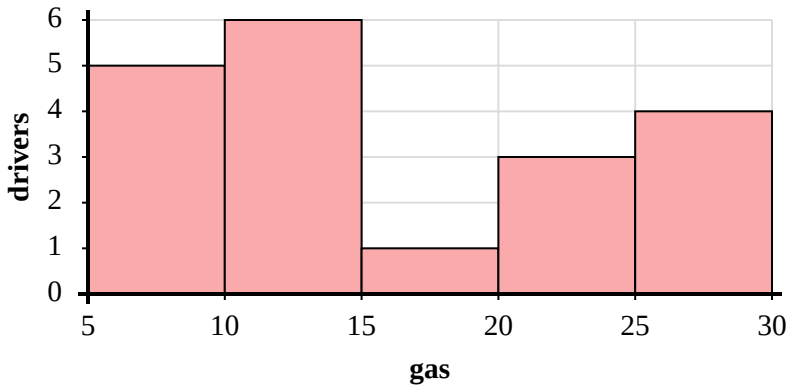
8) If a student scored a 89 which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the gallons of gas drivers purchased each week.



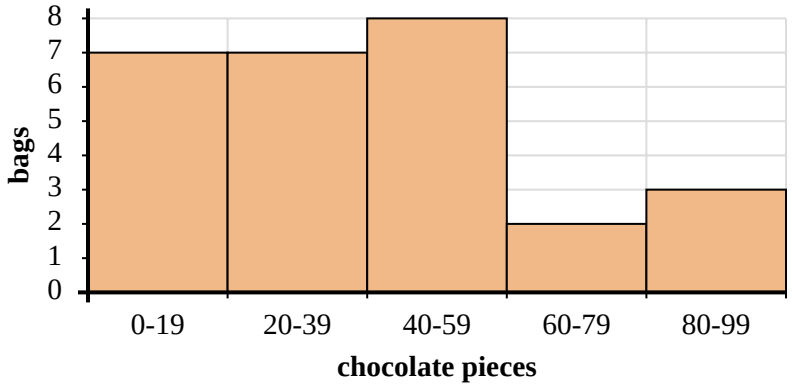
1) Most drivers purchased between ___ and ___ gallons.

2) How many drivers purchased between 5 and 10 gallons?

3) How many drivers are represented in this histogram?

4) If a driver purchased 10 gallons which bar would they be added to?

The histogram below show the quantity of chocolate pieces per bag of trail mix.



5) Most bags had between ___ and ___ pieces of chocolate.

6) How many bags had between 40 and 59 chocolate pieces?

7) How many bags of trail mix are represented in this histogram?

8) If a bag had 19 pieces of chocolate in it, which bar would it be added to?

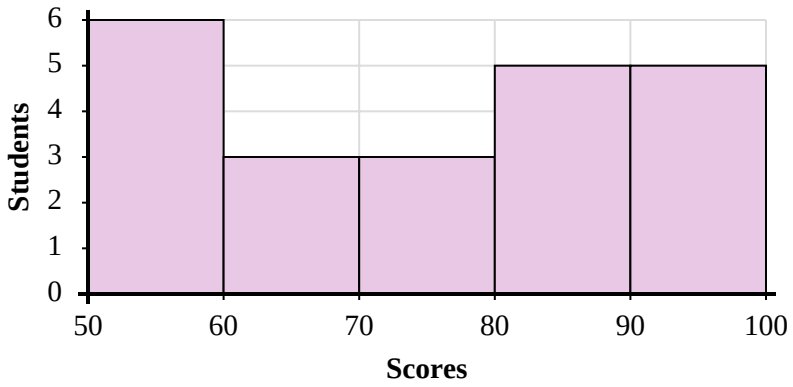
Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

Interpreting Histograms Name:

The histogram below show the students scores for a quiz.



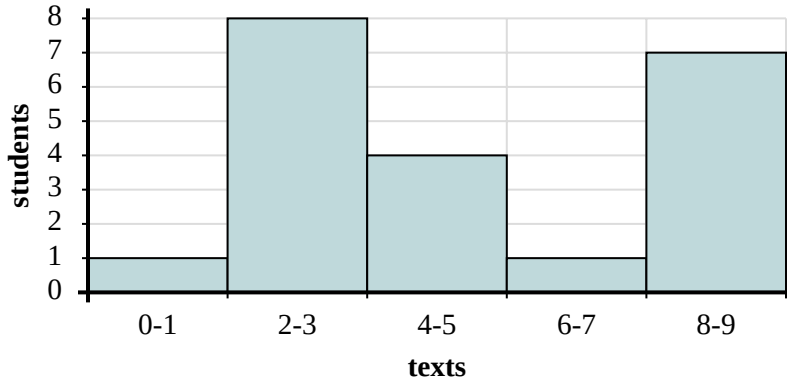
1) Most students scored between a ___ and ___.

2) How many students scored between a 50 and 60?

3) How many students are represented in this histogram?

4) If a student scored a 80 which bar would they be added to?

The histogram below show the number of texts students sent each day.



5) Most students sent between ___ and ___ texts.

6) How many students sent between 8 and 9 texts?

7) How many students are represented in this histogram?

8) If a student sent 7 texts which bar would they be added to?

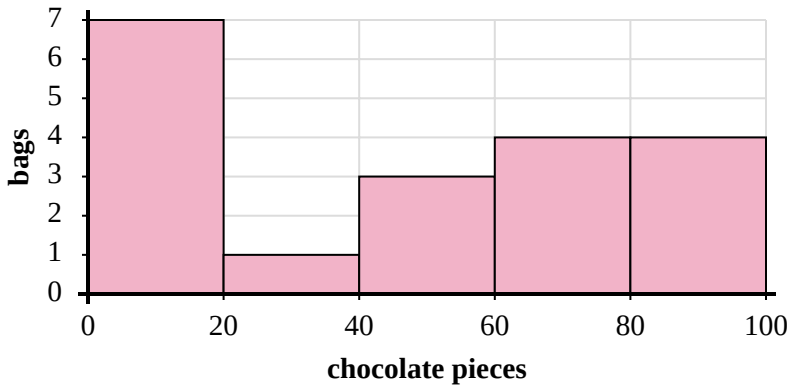
Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

Interpreting Histograms Name:

The histogram below show the quantity of chocolate pieces per bag of trail mix.



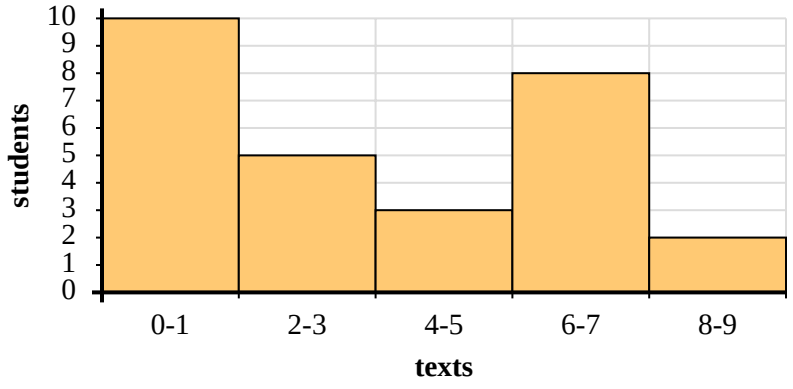
1) Most bags had between ___ and ___ pieces of chocolate.

2) How many bags had between 80 and 100 chocolate pieces?

3) How many bags of trail mix are represented in this histogram?

4) If a bag had 40 pieces of chocolate in it, which bar would it be added to?

The histogram below show the number of texts students sent each day.



5) Most students sent between ___ and ___ texts.

6) How many students sent between 8 and 9 texts?

7) How many students are represented in this histogram?

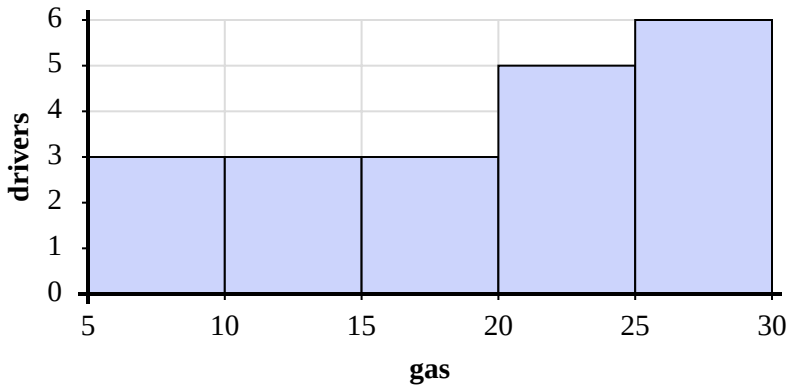
8) If a student sent 5 texts which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the gallons of gas drivers purchased each week.



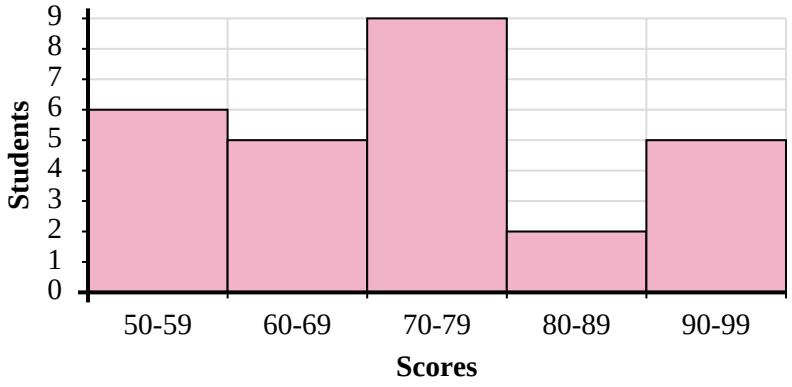
1) Most drivers purchased between ___ and ___ gallons.

2) How many drivers purchased between 5 and 10 gallons?

3) How many drivers are represented in this histogram?

4) If a driver purchased 10 gallons which bar would they be added to?

The histogram below show the students scores for a quiz.



5) Most students scored between a ___ and ___.

6) How many students scored between a 70 and 79?

7) How many students are represented in this histogram?

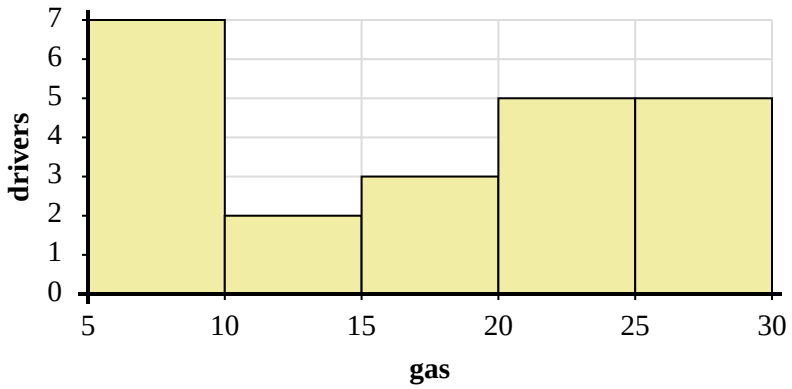
8) If a student scored a 79 which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0

The histogram below show the gallons of gas drivers purchased each week.



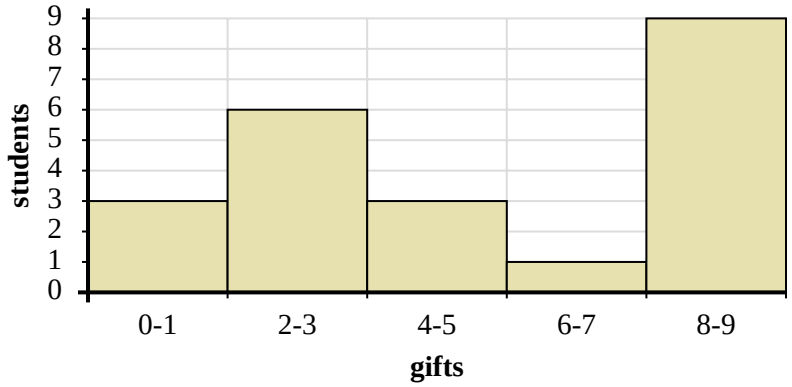
1) Most drivers purchased between ___ and ___ gallons.

2) How many drivers purchased between 10 and 15 gallons?

3) How many drivers are represented in this histogram?

4) If a driver purchased 10 gallons which bar would they be added to?

The histogram below show the number of gifts students received for their birthday.



5) Most students received between ___ and ___ gifts.

6) How many students received between 8 and 9 gifts?

7) How many students are represented in this histogram?

8) If a student received 1 gifts which bar would they be added to?

Answers

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

1-8	88	75	63	50	38	25	13	0