

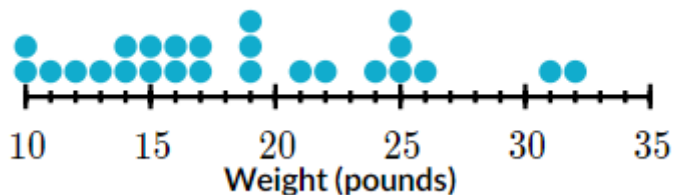
Question Bank-1

1. Suzanne owns a small business that employs 5 other people. Suzanne makes \$100,000 per year, and the other 5 employees make between \$40,000 per year. Suzanne decides to leave the company and keep the other 5 salaries the same. How will this affect the mean and median?

- A) The mean will decrease and the median will increase.
- B) The median will decrease and the mean will increase.
- C) Both will decrease but the median will decrease more than the mean.
- D) Both will decrease but the mean will decrease more than the median.

Ans: D) Mean decreases more than median

2. The dot plot shows the weight, in pounds, of 25 students' filled backpacks. Each dot represents one backpack.



Which of the following is the closest estimate to the percentile for the backpack that weighs 31 pounds?

- A) 92nd percentile
- B) 99th percentile
- C) 84th percentile
- D) 88th percentile

Ans: A) 92nd percentile. There are 23 backpacks before the one that weighs 31 pounds.

$$(23/25) \times 100 = 92$$

3. A golf team's 6 members had the scores below in their most recent tournament: 70, 72, 74, 76, 80, 114.

Which measure (mean, median or mode) would you choose to describe the above data and why? **(1 point)**

Ans: Median

114 is an outlier. It shifts the mean towards it. Hence the mean (81) is higher than every score but one. Therefore the median is a better representation.

4. The following is the distribution of marks of 60 students in a test.

Marks	No of students
4	6
8	12
10	18
12	15
20	9

Find:

A. Mean number of subscribers

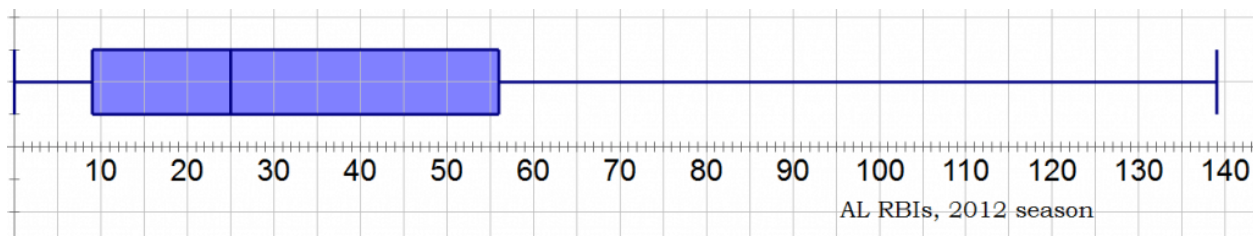
B. Standard deviation

Ans:

Mean= $720/60 = 12$

Standard deviation= $\sqrt{1464/60} = 4.94$

5. The following boxplot shows the 2012 season runs batted in (RBIs) of 280 American League batters (the top 280 batters in terms of number of plate appearances).



A) What is the 75th percentile of this distribution? **Ans:** $Q3 = 56$

B) Find the Interquartile Range. **Ans:** $Q1 = 10$ and $Q3 = 56$, and the difference = **47**

C) How many AL hitters hit more than 25 RBIs in 2012?

Ans: 140

25 is the median. There are 280 hitters on this list: half must be above the median, and half below. Therefore, there are **140** hitters above the median value of 25 RBIs

D) Will the mean of this data be greater or lesser than the median?

Ans: Right skew. Mean will be greater.

6. Approximately 1.7 million students took the SAT in 2015. Each student received a critical reading score and a mathematics score.

Here are summary statistics for each section of the test:

Critical reading- Mean: 495, Standard deviation: 116

Mathematics- Mean: 511, Standard deviation: 120

A) What is the mean and standard deviation of the sum of a student's mathematics and critical reading scores?

B) What is the mean and standard deviation of the difference of a student's mathematics and critical reading scores?

(Assume that both scores are independent and are not correlated)

Ans:

1. Mean= 1006, Std dev= 166.9

2. Mean= 16, Std dev= 166.9

7. There are 5 numbers in a distribution. Their mean is 5 and their mode is 3. Given that 2 and 3 belong to this distribution and all numbers are positive and lesser than 10, find the distribution.

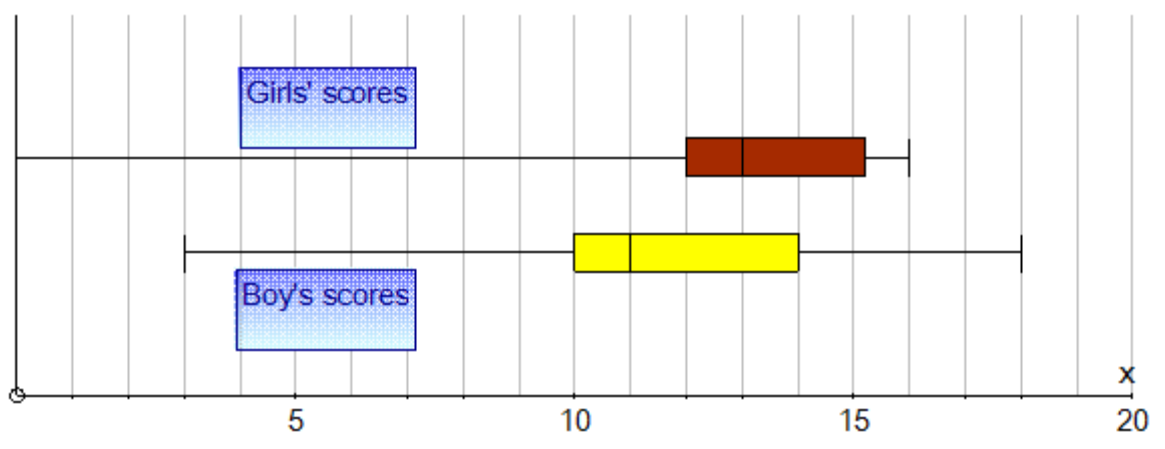
(2 points)

Ans: Mode is 3 so we have 2,3,3

$8+x+y=25$

So the answer is- 2,3,3,8,9.

8. The box plots given below are used to compare the scores of boys and girls in a test.



A) On an average who has performed better? **Ans:** Girls

B) Who is more consistent overall? **Ans:** Boys

9. How can outlier values be treated?

1) To change the value and bring in within a range

2) To just remove the value.

10. Approximately what percentage of scores fall within one standard deviation of the mean in a normal distribution?

- A. 34%
- B. 95%
- C. 99%
- D. 68%

Ans: OPTION D

17. _____ are used when you want to visually examine the relationship between two quantitative variables.

- A. Bar graphs
- B. Pie graphs
- C. Line graphs
- D. Scatterplots

Ans: OPTION D

18. If a test was generally very easy, except for a few students who had very low scores, then the distribution of scores would be _____.

- A. Positively skewed
- B. Negatively skewed
- C. Not skewed at all
- D. Normal

Ans: OPTION B

19. When each member of a population has an equally likely chance of being selected, this is called:

- A. A nonrandom sampling method
- B. A quota sample
- C. A snowball sample
- D. An Equal probability selection method

Ans: OPTION D

20. Which of the following techniques yields a simple random sample?

- A. Choosing volunteers from an introductory psychology class to participate
- B. Listing the individuals by ethnic group and choosing a proportion from within each ethnic group at random.
- C. Numbering all the elements of a sampling frame and then using a random number table to pick cases from the table.
- D. Randomly selecting schools, and then sampling everyone within the school.

Ans: OPTION C

21. Which of the following will give a more “accurate” representation of the population from which a sample has been taken?

- A. A large sample based on the convenience sampling technique
- B. A small sample based on simple random sampling
- C. A large sample based on simple random sampling
- D. A small cluster sample

Ans: OPTION C

22. People who are available, volunteer, or can be easily recruited are used in the sampling method called _____.

- A. Simple random sampling
- B. Cluster sampling
- C. Systematic sampling
- D. Convenience sampling

Ans: OPTION D

23. A number calculated with complete population data and quantifies a characteristic of the population is called which of the following?

- A. datum
- B. statistic
- C. parameter
- D. population

Ans: OPTION C

24. If central tendency is found by using whole population as input data then this is classified as

- A. sample statistic
- B. population statistic
- C. population tendency
- D. population parameters

Ans: OPTION D

25. Measure which describes detailed characteristic of whole data set is classified as

- A. average or central value
- B. positive skewed value
- C. negative skewed value
- D. positive extended value

Ans: OPTION A

26. A medical researcher wants to determine whether exercising can lower blood pressure. At a health fair, he measures the blood pressure of 100 individuals, and interviews them about their exercise habits. He divides the individuals into two categories: those whose typical level of exercise is low, and those whose level of exercise is high. Is this a controlled experiment or an observational study?

Ans: Observational study

27. In a certain company, every worker received a \$50-per-week raise. How does this affect the mean salary? The standard deviation of the salaries?

Ans: Means increases by 50 and SD remains same

28. In a sample of 20 men, the mean height was 178 cm. In a sample of 30 women, the mean height was 164 cm. What was the mean height for both groups put together?

Ans: $178 + 164 / 2$

29. There are 10 employees in a particular division of a company. Their salaries have a mean of \$70,000, a median of \$55,000, and a standard deviation of \$20,000. The largest number on the list is \$100,000. By accident, this number is changed to \$1,000,000.

a. What is the value of the mean after the change?

b. What is the value of the median after the change?

c. What is the value of the standard deviation after the change?

Ans: Mean = 160000

Median has no effect

Std Dev cannot be predicted

30. True or false: In any boxplot,

a. The length of the whiskers is equal to 1.5 IQR, where IQR is the interquartile range.

Ans: TRUE

b. The length of the whiskers may be greater than 1.5 IQR, where IQR is the interquartile range. **Ans: FALSE**

c. The length of the whiskers may be less than 1.5 IQR, where IQR is the interquartile range. **Ans: FALSE**

d. The values at the ends of the whiskers are always values in the data set used to construct the boxplot. **Ans: TRUE**