Date Completed: _____
Mentor Initials: _____



# Statistical Measures (Intermediate)

**1.** Data Set A consists of the 10 numbers listed below. Data Set B consists of the 10 numbers in A and an 11th number, which is greater than 94. How will the mean and the median of B compare to the mean and the median of A?

$$64, 78, 78, 82, 86, 89, 92, 93, 95, 96$$

**A.** The mean and the median of B will each be greater than the mean and the median of A.
**B.** The mean and the median of B will each be less than the mean and median of A.
**C.** The mean of B will be less than the mean of A but the median will be greater.
**D.** The mean of B will be greater than the mean of A but the median will be lesser.
**E.** Cannot be determined from the given information.

**2.** For 30 quiz scores in a typing class, the table below gives the frequency of the scores in each score interval. Which score interval contains the median of the scores?

| Score Interval | Frequency |
|---|---|
| 96-100 | 5 |
| 91-95 | 3 |
| 86-90 | 5 |
| 81-85 | 6 |
| 76-80 | 11 |

**A.** $96 - 100$
**B.** $91 - 95$
**C.** $86 - 90$
**D.** $81 - 85$
**E.** $76 - 80$

**3.** The average weight of 10 boys is 84.0 pounds. If the youngest boy is excluded, the average weight of the 9 remaining boys is 87.0 pounds. What is the weight, in pounds, of the youngest boy?

**A.** 57
**B.** 64
**C.** 68
**D.** 72
**E.** 76

**4.** James is doing an experiment to determine whether a high-protein food affects the ability of white mice to find their way through a maze. The mice in the experimental group were given the high-protein food; the mice in the control group were given regular food. James then timed the mice as they found their way through the maze. The table below shows the results.

| Mouse Number | Experimental Group | Control Group |
|---|---|---|
| 1 | 1 min 35 sec | 2 min 13 sec |
| 2 | 1 min 55 sec | 1 min 53 sec |
| 3 | 2 min 7 sec | 2 min 43 sec |
| 4 | 1 min 29 sec | 2 min 13 sec |
| 5 | 1 min 59 sec | 2 min 3 sec |

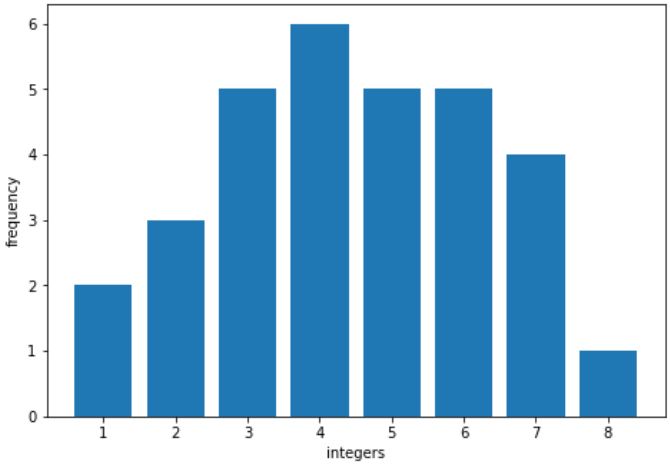
The average time the mice in the experimental group took to find their way through the maze was how many seconds less than the average time taken by the mice in the control group?

**A.** 9
**B.** 18
**C.** 24
**D.** 29
**E.** 31

**5.** To promote a new brand of hats, a clothing store will run a promotion using a jar containing 3 red balls marked "15% off," 2 white balls marked "25% off," and 1 green ball marked "40% off." Each customer will randomly select 1 ball from the jar to determine the discount that the customer will receive on any single pair of the new brand of hats. Given that the new brand of hats regularly costs $35 per hat, which value is closest to the average discount amount, in dollars, that the store can expect to give each customer due to this promotion?

**A.** $4.12
**B.** $4.80
**C.** $5.94
**D.** $6.75
**E.** $7.88

**6.** The graph below shows the distribution of a data set consisting of 31 positive integers. Which of the following statements about the mean, median, and mode of the data set is true?




**A.** The mode is less than the median, and the median is less than the mean.
**B.** The mode is less than the mean, and the mean is equal to the median.
**C.** The mode is equal to the mean, and the mean is less than the median.
**D.** The mean is greater than the median, and the median is equal to the mode.
**E.** The mean is equal to the median, and the median is equal to the mode.

**7.** The first 8 terms in an arithmetic sequence are listed below. What is the difference between the mean and the median of the 8 terms?

$$\frac{1}{4},\ 1,\ \frac{7}{4},\ \frac{10}{4},\ \frac{13}{4},\ 4,\ \frac{19}{4},\ \frac{22}{4}$$

**A.** 0
**B.** $\frac{5}{4}$
**C.** $\frac{4}{3}$
**D.** 2
**E.** $\frac{5}{2}$

**8.** In a physics course, a student scored 97 on one test, 93 on another test, and 86 on each of the other tests. The student's test average for the course, where each test is weighted equally, is exactly 92. What is *total number* of tests that the student has taken in the course?

**A.** 1
**B.** 3
**C.** 5
**D.** 6
**E.** 7

**9.** There are exactly 6 people in a bookstore at 11:30 a.m. Each person earns an annual income that is between \$40,000 and \$50,000. No one enters or leaves the bookstore until 12:00 p.m., when a professional athlete with an annual income of more than \$800,000 enters the bookstore and joins the other 6 people. The mean, median, range, and standard deviation of the annual incomes of the 6 people in the bookstore at 11:30 a.m. are calculated and compared to the same 4 statistics of the annual incomes of the 7 people in the bookstore at 12:00 p.m. If it can be determined, which of the 4 statistics changed the least?

**A.** Range
**B.** Mean
**C.** Median
**D.** Standard Deviation
**E.** Cannot be determined from the given information.

**10.** The average of 7 distinct scores has the same value as the median of the 7 scores. The sum of the 7 is 490. What is the sum of the 6 scores that are NOT the median?

**A.** 395
**B.** 420
**C.** 435
**D.** 440
**E.** 450

**11.** The list of numbers $45, 39, 28, X, Y, 21$ has a median of 27. The mode of the list of numbers is 21. To the nearest whole number, what is the mean of the list?

**A.** 21
**B.** 26
**C.** 27
**D.** 30
**E.** 32

**12.** Which of the following data sets has the greatest standard deviation?

**A.** $2, 2, 2, 14, 14, 14$
**B.** $2, 3, 4, 5, 6, 7$
**C.** $2, 7, 7, 14, 14, 16$
**D.** $7, 7, 7, 7, 7, 7$
**E.** $7, 8, 9, 10, 11, 12$

**13.** The median of a set of data containing 11 items was found. Six data items were added to the set. Three of these items were greater than the original median and the other 3 items were less than the original median. Which of the following statements *must* be true about the median of the new data set?

**A.** It is the average of the 3 new lower values.
**B.** It is the same as the original median.
**C.** It is the average of the 3 new higher values.
**D.** It is greater than the original median.
**E.** It is less than the original median.

**14.** At West High School, the 30 cast members of the spring musical sold tickets for the Friday night and Saturday night performances. The stem-and-leaf plot below shows the number of tickets sold by each of the 30 cast members.

| Stem | Leaf |
|---|---|
| 0 | 4 8 |
| 1 | 3 5 7 8 8 |
| 2 | 1 2 8 9 9 |
| 3 | 0 0 1 1 2 3 8 8 9 |
| 4 | 3 4 4 8 |
| 5 | 0 1 2 2 2 |

Key: 1 | 4 = 14

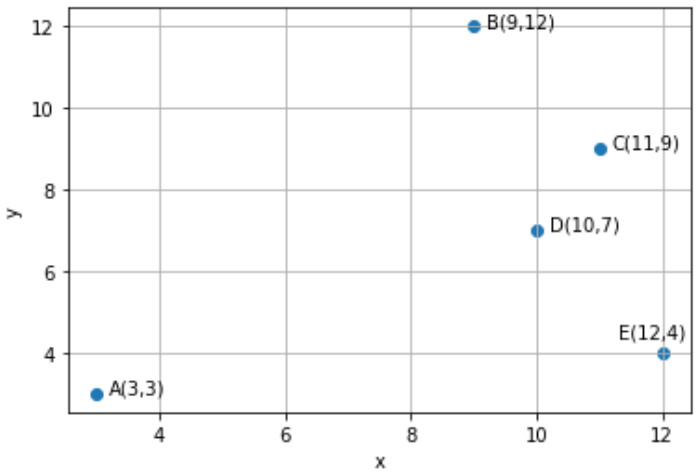
What is the median number of tickets sold?

**A.** 24
**B.** 27
**C.** 29
**D.** 30
**E.** 31

**15.** For which of the following data sets is the difference between the mean and the median the greatest?

**A.** $\{20, 20, 20, 20\}$
**B.** $\{20, 20, 30, 40\}$
**C.** $\{20, 30, 30, 30\}$
**D.** $\{20, 30, 30, 120\}$
**E.** $\{20, 40, 100, 120\}$

**16.** The points graphed in the standard $(x, y)$ coordinate plane below show the positions of the 5 stars in a plane relative to a point represented by the origin, where each coordinate unit equals 1 light-year. Because Stars $B, C, D,$ and $E$ have the same mass, the position determined by the average of the $x-$coordinates and the average of the $y-$coordinates of those stars approximates the center of mass of those 4 stars. What are the coordinates of this position?




**A.** $\left(9\frac{3}{4}, 7\right)$
**B.** $\left(10\frac{1}{2}, 8\right)$
**C.** $(11,9)$
**D.** $(12,10)$
**E.** $\left(12,10\frac{1}{2}\right)$

**17.** Set A and Set B each consist of 9 distinct numbers. The 2 sets contain identical numbers with the exception of the number with the least value in each set. The number with the least value in Set A is greater than the number with the least value in Set B. The value of which of the following measures *must* be greater for Set A than for Set B?

**A.** Mean only
**B.** Median only
**C.** Mode only
**D.** Mean and median only
**E.** Mean, median, and mode