**Statistics**

Prepared by: Tanmay Patil

1. Above are the measures of rainfall for 5 consecutive days during the winter. For the measure of those 5 days, which of the following is true?
2. The median equals the mode.
3. The median equals the arithmetic mean.
4. The range equals the median

Answer:

* Arranging in ascending order: 2”, 2”, 5”, 6”, 10”
* Mean = (2+2+5+6+10)/5 = 5”
* Median = ((5+1)/2)th term = 3rd term = 5”
* Mode = 2”
* Range = 10” – 2” = 8”
* Solution: **b) II only**

1. The only test scores for the students in a certain class are 15, 30, 40 30, x, 50 and 30. If x equals one of the other scores and is a multiple of 5, what is the mode for the class?

Answer:

* 30 occur 3 times. No matter what value x takes no value (other than 30) will have a frequency more than or equal to 3
* Solution: **b) 30**

1. If half the range of the increasing series {11, A, 23, B, C, 68, 73} is equal to its median, what is the median of the series?

Answer:

* Range = 73-11 = 62
* Median = ½ Range = 62/2 = 31
* Solution: **31**

1. The average (mean) GRE score for a group of M students in Montana is 1400, while the mean GRE score for a group of V students in Virginia is 1050. When the scores of both groups are combined, the mean is 1300. What is the value of M/V?

Answer:

* Let M be the number of students in Montana and V in Virginia
* Solution: **5/2**

1. The average (mean) of eight numbers is 8. If 2 is subtracted from each of four of the numbers, what is the new average (or mean)?

Answer:

* Let the numbers be a, b, c, d, e, f, g and h
* Solution: **7.0**

1. The arithmetic mean of scores of a group of students in a test was 52. The brightest 20% of them secured a mean score of 80 and the dullest 25% a mean score of 31. Find the mean score of the remaining 55% of the group.

Answer:

* Let the mean of remaining 55 students be x
* x = **51.36**

1. If the sum of a and b is c, what is the arithmetic mean of a and b in terms of a, b and c?

Answer:

* Solution: **c/2**

1. The median of the observations 8, 11, 13, 15, x+1, x+3, 30, 35, 40, 43 arranged in an ascending order is 22. Find x.

Answer:

* Total of 10 terms
* x = **20**

1. Five coins were simultaneously tossed 1000 times and at each toss the number of heads were observed. The number of tosses during which 0, 1, 2, 3, 4 and 5 heads were obtained are shown in the table below. Find the mean number of heads per toss.

Answer:

1. Which of the following is true for the following the data?

Answer:

* Range = 75-52 = 23
* Median = 60
  + Total number of students is 30
  + So, median is average of 15th and 16th term
  + Make a new row of cumulative number of students
  + Both 15th and 16th students have scored 60 marks
* Mode = 52
* Solution: **None**

1. The mean annual salary of all employees in a company is Rs 25000. The mean salary of male and female employees is Rs 27000 and Rs 17000 respectively. Find the percentage of males employed in the company.

Answer:

* Let there be m males and f females
* m = 4f
* Solution: **80%**

1. What is the difference between the range and the median of the following data?

Answer:

* Range = 80-9 = 71
* Total of 43 students, so median is 22nd term
* Median = 25
* Solution: 71-25 = **46**

1. What is the range of people with neither washing machine nor dishwasher if 14% use washing machine and 27% use dishwasher?

Answer:

* Draw Venn diagrams
* Case 1:
  + If no one uses both
  + People who use neither = 100 – (27+14) = 59
* Case 2:
  + If all the people who use washing machine also use dishwasher
  + People who use neither = 100 – 27 = 73
* Range = 73-59 = **14%**

1. In a set of positive, distinct integers {a, b, c, d, e}, median is 16. What is the minimum value of a +b +c +d +e?

Answer:

* Assume the dataset is already arranged in ascending order
* c = 16
* Minimum possible value for the rest are: a=1, b=2, d=17, e=18
* Solution: 1+2+16+17+18 = **54**

1. A student obtained a mean of 100 observations as 40. It was later discovered that he had wrongly copied down an observation 50 instead of 40. Calculate the correct mean.

Answer:

* Let sum of marks of 99 students be S
* Original Calculation
* New Calculation
* Get Value of S from 1st equation and substitute in 2nd equation
* Solution: **39.9**

1. What is the difference between the standard deviation of 3, 4, 5, 6 and that of 81, 82, 83, 84?

Answer:

* Analytical solution
  + Standard Deviation is the measure of the spread of the data points
  + For both the datasets the spread is the same, the difference between their standard deviation is 0.
* Numerical solution
  + 1st Dataset: {3,4,5,6}
  + Mean = 4.5
  + Deviations = {-1.5,-0.5,0.5-1.5}
  + Deviation squares = {2.25,0.25,0.25,2.25}
  + Standard deviation = √(5/4)
  + 2nd Dataset {81, 82, 83, 84}
  + Mean = 82.5
  + Deviations = {-1.5,-0.5,0.5-1.5}
  + Deviation squares = {2.25,0.25,0.25,2.25}
  + Standard deviation = √(5/4)
  + So difference = 0
  + Actually you should stop after finding deviations. Because they are equal, corresponding Standard deviations would also be equal.
* Solution: **0**

1. In a list of four positive even numbers, the mean, median and mode are all equal. Which of the following CANNOT be done to the list if the mean, median, and mode are to remain equal?

Answer:

* Construct a dataset so that mean median mode are all equal {1, 2, 2, 3}
* Test all the options
* For option a, add 2 -> {1, 2, 2, 2, 3}
* For option c, add 0 and 4 -> {0, 1, 2, 2, 3, 4}
* For option d, add 2 to all data points -> {3, 4, 4, 5}
* For option e, -> {2, 2}
* For all option above: mean = median = mode.
* Solution: **Option b)**

1. The average of five positive even integers is 60. If p is the greatest of these integers, what is the greatest possible value of p?

Answer:

* Let the numbers be a, b, c, d, p
* To maximize p, we need to minimize a, b, c and d
* Minimum possible values for a, b, c and d are 2, 2, 2 and 2
* –>

1. If the median of n consecutive odd integers is 6, which of the following must be the average of the n integers?

Answer:

* Average (arithmetic mean) and median of data points which are in Arithmetic Progression are equal.
* Average = median = **6**

1. Adam delivered n pizzas on Monday, 5 times as many pizzas on Tuesday as on Monday, 3 fewer pizzas on Wednesday than on Tuesday, and 7 more pizzas on Thursday than on Tuesday. What is the average number of pizzas he delivered per day over the 4 days?

Answer:

* Monday: n
* Tuesday: 5n
* Wednesday: 5n-3
* Thursday: 5n+7

1. What is the mean of the squares of the first 10 natural numbers

Answer:

* Sum = 12 + 22 + 32 + 42 + 52 + 62 + 72 + 82 + 92 + 102 = 385
* Mean = 385/10 = **38.5**