



AnswerVerifiedHint: To find mean, median, mode, and range of the given data sets we will first define each of them and then by using definition and their formula will calculate mean, median, mode, and range. Mean of a line terms in that set} \$ Median of a data set is given by $\{\{\left(\frac{1}{2}+1\right)^{th}\}$ term, if the total number of terms in the set is odd and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$, if the total number of terms in the set is even and also arranged in increasing order. And, by $(\frac{1}{2}+1)^{th}\}$ term $\{2\}$ t order.Mode of a data set is the number that occurs most frequently in the given data set. And, the range of the data set is equal to the difference between the maximum and the minimum value of the given data set. calculating their values for the set given in the question. Mean of a given data set is the average of all the terms present in the given set}} {\text{Total number of terms in that set}} Median of a given data set is the value which lies exactly in the middle of the given set when we arrange the given set in increasing order. And, median is given by: $\{\{\left(\frac{n+1}{2} \right)^{th}\}$ term, if the total number of terms in the set is odd. And, by $\left(\frac{n+1}{2} \right)^{th}\}$ term which occurs the maximum number of times in the data set. And, Range of the data set is equal to the difference between the maximum and the minimum value of the given data set. Now, by using the above definition and formula we will find the mean, median, and mode of the given data set. So we can see that the data set is 2, 3, 4, 3, 5, 5, 6, 7, 8, 9, 6, 6, 5, 3. We will first find the mean of the given data. From the above definition we know that: Mean = $\left(\frac{14}{14}\right) = \frac{14}{14} = \frac{14}{14$ calculating the median, mode and range we will first arrange the given data in ascending order. So, after arranging the data set in ascending order we will get: 2, 3, 3, 4, 5, 5, 6, 6, 6, 7, 8, 9We can see that total number of terms in the above data is 14, which is even and we also that when number of terms is even then median is given by: $drac{{(left(), drac{n}{2}+1)}^{th}}term + {(left(), drac{14}{2}+1)}^{th}}term + {(left(), drac{14}+1)}^{th}}term + {(left(),$ mode. Since, from above definition of mode we know that mode is the number that occurs most frequently in the given data set 2, 3, 3, 4, 5, 5, 6, 6, 6, 7, 8, 9 we can see that 3, 5, and 6 all three occur 3 times in the given data and it is the maximum occurrence in the data set. Hence, mode is equal to 3, 5, 6. Now, we will calculate the range of the given data. From the above definition we know that range is difference of greatest and lowest term in the set 2, 3, 3, 4, 5, 5, 5, 6, 6, 6, 7, 8, 9, we can see that 2 is the minimum term and 9 is the maximum term and 9 is the minimum term and 9 is the maximum term and 9 is th our required answer.b). From the question we can see that the data set is 13, 7, 8, 8, 2, 9, 11, 7, 8, 4, 5We will first find the mean of the given data. From the above definition we know that:Mean = \$\dfrac{\text{Sum of all the term in given set}}{\text{Total number of terms in that set}}\$So, we can say that mean = \ $[drac{13+7+8+8+2+9+11+7+8+4+5}{11}] = (drac{67}{14}) =$ odd and we also that when number of terms is odd then median is given by: $\{\left(\frac{1+1}{2}\right)^{th}\right)^{th}\ = \\ \{\left(\frac{1+1}{2}\right)^{th}\right)^{th}\ = \\ \{\left(\frac{1+1}{2}\right)^{th}\ = \\ \{\left(\frac$ that occurs most frequently in the given data set. So, in the data set 2, 4, 5, 7, 7, 8, 8, 8, 9, 11, 13 we can see that 8 occurs 3 times in the given data and it is the maximum occurrence in the data set. Hence, mode is equal to 8. Now, we will calculate the range of the given data. From the above definition we know that range is difference of greatest and 48, 44, 46. We will first find the mean of the given data. From the above definition we know that: Mean = $\left(\frac{5+48+60+42+53+47+51+54+49+48+47+53+48+44+46}{15}\right) = \left(\frac{735}{15}\right) = 49$ Now, before calculating the median, mode and range we will first arrange the given data in ascending order. So, after arranging the data set in ascending order we will get: 42, 44, 45, 46, 47, 47, 48, 48, 49, 51, 53, 53, 54, 60.. We can see that total number of terms in the above data is 15, which is odd and we also that when number of terms is odd then median is given by: $\{\{\left(\frac{15+1}{2} \right)^{th}\}$ = $\{\left(\frac{15+1}{2} \right)^{th}\}$ = $\{\{\left(\frac{15+1}{2} \right)^{th}\}$ = $\{\{\left(\frac{15+1}{2} \right)^{th}\}$ = $\{\left(\frac{15+1}{2} \right)^{th}\}$ = $\{\left($ data set 42, 44, 45, 46, 47, 47, 48, 48, 48, 49, 51, 53, 53, 54, 60, we can see that 48 occurs 3 times in the given data and it is the maximum occurrence in the data set. Hence, mode is equal to 48. Now, we will calculate the range of the given data. From the above definition we know that range is difference of greatest and lowest term in the set and in the set 42, 44, 45, 46, 47, 47, 48, 48, 49, 51, 53, 53, 54, 60, we can see that 42 is the minimum term and 60 is the maximum term so range is equal to (60 - 42) = 18. Hence, mean = 48, mode = 48, and range = 18 is our required answer. Note: While calculating the median of the given data set, it is very much necessary to arrange the given data set in increasing order, otherwise students will not get the correct answer and there is so much chance of making mistakes which writing sets frequently, so students are required to take care of that. The mean, the median and the mode are three different measures of average which we can use. The range is a measure of how spread out data is. The ModeThe mode is the value that appears most often. The MedianThe median is the middle numbers are in order). The MeanTo calculate the mean add up all the numbers are in order. Example 1: Here are a list of 7 numbers: 7 4 7 9 5 1 2Find:a) The mode by The medianc) The medianc) The median is the mode is 7 by The median is the middle number (but only when the numbers are in order) We have to put the numbers in order: 1 2 4 5 7 7 9We 13 5 11 11 11 9Find:a) The mode is 11 b) To find the median (the middle number) we need to put the numbers in order: 5 6 6 9 11 11 11 13We can see that there is not one middle number, we have 9 11 + 138 = 728 = 9The mean is 9 d) To find the range we take the smallest number away from the biggest number13 - 5 = 8The range is 8 Try these: Calculate the mode, the median, the mean and the range is 8 Try these values are used to define the various parameters of the given data set. The measure of central tendency (Mean, Median, and Mode) gives useful insights about the data studied, these are used to study any type of data such as the average salary of employees in an organization, the median age of any class, the number of people who plays cricket in a sports club, etc.Let's learn more about the Mean, Median, and Mode, their formulas, and examples.Table of ContentMeasures of Central TendencyWhat is Mode?Relation between Mean, Median, and Mode?What is Mode?What Mode link to Real Life?Solved Questions on Mean, Median, and ModeUnsolved Practice Questions on Mean, Median, and ModeMeasures of central tendency is the representation of various values of the given data set. There are various measures of central tendency is the representation of various values of the given data set. distributed.Median (M): The median is the middle values when the dataset is arranged in ascending or descending Unlike the mean and median, the mode can be applied to both numerical and categorical data. It's useful for identifying the most common value in the data set. It is also called the Arithmetic Average. The Mean is denoted as x and is read as x bar. The formula to calculate the mean is: Formula for MeanMean Symbol used to represent the mean, or arithmetic average, of a dataset is typically the Greek letter "" (mu) when referring to the sample mean. Population mean, and "x" (x-bar) These symbols are commonly used in statistical notation to represent the average value of a set of data points. Mean Formula to calculate the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set then the mean is: Mean (x) = xi/ nIf x1, x2, x3,, xn are the values of a data set the v 30, 40, 20, 50 is Mean = (sum of all values) / (number of values) Mean = (10 + 30 + 40 + 20 + 50) / 5 = 30 Mean of Grouped data can be calculated by using various methods. The most common methods used are discussed in the table below: Direct MethodAssumed Mean MethodAssumed Mean MethodAssumed Mean MethodAssumed Mean MethodStep Deviation Methods. is the sum of all frequenciesx = a + fixi / fiWhere, a is the Assumed meandi is equal to xi afi the sum of all frequenciesRead More about Mean, Median and Mode of Grouped Data. A Median is a middle value for sorted data. The sorting of the data can be done either in ascending order. A median divides the data into two halves. The formula to calculate the median of the number of terms is odd is shown in the image below. Median Formula to calculate the median of the number of terms is odd is shown in the image below: Median Formula for Odd TermsThe letter "M" is commonly used to represent the median of a dataset, whether it's for a population or a sample. This notation simplifies the representation of statistical practice, "M" is widely accepted and understood as the symbol for the median is: Median = [(n + 1)/2]th termIf the number of values (n value) in the data set is even, then the formula to calculate the median is: Median = [(n/2)th term + $\{(n/2)$ + 1}th term] / 2Example: Find the median of the data set 30, 40, 10, 20, and 50.Solution: Median of the data 30, 40, 10, 20, 50 is, Step 1: Order the given data set) is even or odd and find the median of the data set 30, 40, 10, 20, 50 is, Step 3: Here, n = 5 (odd) Median = [(n + 1)/2] th term Median = 1 + [(n/2 - cf) / f] the median of the grouped data median is calculated using the formula, Median = 1 + [(n/2 - cf) / f] the median of the grouped data median is calculated using the formula, Median = 1 + [(n/2 - cf) / f]median class.Read More about Medianof Grouped Data.What is Mode? A mode is the most frequent value or item of the data set can generally have one or more than one mode then it is called "Bimodal" and if the data set contains 3 modes then it is known as "Trimodal". If the data set consists of more than one mode then it is known as "multi-modal" (can be bimodal or trimodal). There is no mode for a data set if every number appears only once. The formula to calculate the mode is shown in the image below: Formula of MedianSymbol of ModeIn statistical notation, the symbol "Z" is commonly used to represent the mode of a dataset. It indicates the value or values that occur most frequently within the dataset. This symbol is widely utilized in statistical discussions and analyses. Mode FormulaMode = Highest Frequency TermExample: Find the mode of the given data set 1, 2, 2, 2, 3, 3, 4, 5. Solution: Given set is {1, 2, 2, 2, 3, 3, 4, 5} As the above data set we can say that, Using the formulaMode = Highest Frequency (3) Mode of Grouped DataThe mode of the grouped data is calculated using the following formula:Mode = 1 + [(f1 + f0) / (2f1 - f0 - f2)] hwhere,f1 is the frequency of the modal class,f0 is the frequency of the class succeeding the modal class,f2 is the frequency o data, the relation between the three central tendencies mean, median, and mode is shown in the image below: Mode = 3 Median 2 MeanMode = 3 Median 2 MeanMode = 3 Median 2 MeanMode = 3 Median, the and Mode: Another name for this relationship is an empirical relationship. When we know the other two measures for a given set of data, this is used to find one of the 174, 175, 177, and 181, respectively. Then, the range of the data set is (181 - 160) = 21 cm.Range of DataRange is the difference between the highest value. It is a way to understand how the numbers are spread in a data set. The range of any data set is easily calculated by using the formula given in the image below: Formula to Find RangeRange FormulaThe formula to find the Range = Highest value - Lowest Value Example: Find the range of the given data set 12, 19, 6, 2, 15, 4} Here, Lowest Value = 2 Highest Value = 19 Z = 17 Mean, median, and mode are measures of central tendency in statistics.FeatureMeanMedianModeDefinitionMean is the most frequently occurring value in the dataset.Sensitive to outliers.The median is sorted.Mode is the most frequently occurring value in the dataset.Sensitive to adding up all values of a dataset and dividing them by the total number of values in the dataset. Calculated by finding the middle value of the mean may or may not be in the dataset. Value of the median is always a value from the dataset. The value of the mean may or may not be in the dataset. The value of the median is always a value from the dataset. The value of the mean may or may not be in the dataset. The value of the mean may or may not be in the dataset. The value of the mean may or may not be in the dataset. The value of the median is always a value from the dataset. The value of the mean may or may not be in the dataset. the mode is also always a value from the dataset.Note: Mean gets easily affected by extreme values.Let's look at the following example. In a school, there are 8 teachers whose salaries are 20000 rupees, a principal with a salary of 35000, find their mean salary and median salary. Mean = (20000 + 20000 +observation.Median = 20000Therefore, the median is 20,000.Mode is the data with maximum frequency Mode = 20,000. Read More: Difference between Mean and Average.In our daily lives, we come across various instances where we have to use the concepts of mean, median and mode. heres how they link to real life:Mean: Mean, or average, is used in everyday situations to understand typical income than income. Median is in household income data, the median income provides a better representation of the typical income than the mean when there are extreme values. In real estate, the median house price is often used to gauge the affordability of homes in a particular area. Mode: Mode represents the most frequently occurring value in a dataset and is used in scenarios where identifying the most frequently occurring value in a dataset and is used in scenarios where identifying the most frequently occurring value in a dataset and is used to identify the most common defect in a production line to prioritize quality control effortsQuestion 1: Study the bar graph given below and find the mean, median, and mode of the given data in ascending 189, 185, 153, 147, 161, 127, 180 Solution: For Mean: 190, 153, 168, 179, 194, 153, 165, 187, 190, 170, 165, 189, 185, 153, 147, 161, 127, 180 Number of observations) = (190+153+168+179+194+153+165+187+190+170+165+189+185+153+147+161+127+180) / 18 = 2871/18 = 2871/18 = 2871/18 159.5Therefore, the mean is 159.5For Median: The ascending order of given observations is, 127, 147, 153, 153, 161, 165, 165, 163, 170, 179, 180, 190, 194Here, n = 18Median = 1/2 [(n/2) + (n/2 + 1)]th observation = 1/2 [9 + 10]th observation = with the highest frequency = 153Thus, mode = 153For Range:Range = Highest value Lowest value = 194 127 = 67Question 3: Find the Median of the data 25, 12, 5, 24, 15, 22, 23, 25Step 1: Order the given data in ascending order as:5, 12, 15, 22, 23, 25Step 2: Check n (number of terms of data set) is ever or odd and find the median of the data with respective 'n' value. Step 3: Here, n = 8 (even) then, Median = [(n/2)th term + {(n/2) + 1}th term] / 2 = (22+23) / 2 = 22.5 Question 4: Find the mode of the given data set 15, 42, 65, 65, 95. Solution: Given data set 15, 42, 65, 65, 95. Solution: Given data set 15, 42, 65, 65, 95. The number with highest frequency = 65Mode = 65Question 1: A company recorded the weekly sales (in dollars) of five salespersons as follows: \$450, \$520, \$480, \$510, and \$490, Find the median of the following data set: 12, 15, 20, 9, 17, 25, 10. Question 3: A survey collected the number of books read by a group of 10 people last year: 5, 7, 6, 5, 9, 7, 8, 5, 10, 6. What is the mode of the data set?Question 4: In a classroom, the scores (out of 100) for a test are: 56, 78, 67, 45, 56, 90, 56, 67, 78, and,82. Find the mean, median, and mode of the scores.Question 5: In a skewed distribution the mean of the data is 35. Calculate the mode of the data set. Ans 1: Mean = \$490Ans 2: Median = 15. Ans 3: Mode = 56. Ans 4: Mean = 67. 5. Median = 67. Mode = 25Conclusion Mean, Median and Mode are essential statistical measures of central tendency that provide different perspectives on data sets. The mean provides a general average, making it useful for evenly distributed data. The median gives a middle value, providing a better view of central tendency when dealing with skewed distributions or extreme values and, the mode highlights the arithmetic average of a dataset. It is calculated by summing up all the values in the dataset and dividing the sum by the total number of values. For instance, if you have the numbers 2, 4, 6, 8, and 10, the mean would be (2 + 4 + 6 + 8 + 10) / 5 = 6. The three distinct calculations associated with the Measure of Central Tendency are the Mean, Median, and Mode. Each measurement is an attempt to capture the essence of how a typical entry or number in the data set may look like. The idea is to compute a single value that can represent the entire elements of the set. In this lesson, I have prepared eight (8) worked examples to illustratehow to perform the required computations. Measures of the set. In this lesson, I have prepared eight (8) worked examples to illustratehow to perform the required computations. central tendency. MEAN Description: Average value of the set of numbers to get a total, then divide by the number of entries (number count of values you added). Advantages: Takes into account every number in the data set. That means all numbers are included in calculating the mean. Easy and quick way to represent the entire data values by a single or unique numberdue to its straightforward method of calculation. Each set has a unique mean value. Disadvantages: Its value is easily affected by extreme values known as the middle or centermost number. If there are two middle numbers, add them and divide by 2to get the median. Advantages: Not affected by the outliers in the data set. An outlier is a data point that is radically distant or away from common trends of values and the median is intuitive and thus can easily be explained as the center value. Each set has a unique medianvalue. Disadvantages: Its value or item of the set How to find Tally or count how many times a number appears in the list of data. The mode is the one that shows the most. Advantages: Just like the median, the mode is not affected by outliers. Useful to find the most popular or common item. This includes data sets that donot involve numbers. Disadvantages: If the set contains no repeating values, themode is irrelevant. In contrast, if there are many values that have the same count, then mode can be meaningless. I did not include the range in the tabs above because it is not really a measure of central tendency. However, the concept of range is usually discussed alongside Mean, Median, and Mode. So, what is it then? RANGE Range (in statistics) is the difference between the maximum and minimum values of the set. What the range provides is a quick and rough estimate of the spread of data values within a set. Consider the two scenarios below. Here we have two classes taking Algebra 1 and the ages of the students in each class. Observations: Since the range of Class A is smaller than in Class B, can we claim that the agedistribution in Class A is more clustered (closely related) than in ClassB? In other words, are the ages listed in Class A more uniform than in Class B? Not so fast! This is, in fact, the biggest limitation of using the range to describe the spread of data within a set. The reason is that it can drastically be affected by outliers(values that are not typical as compared to the rest of the elements in the set). Notice that when we disregard the outliers in Class B (ages 11 and 18), the new range becomes which is now equal to the range, especially when comparing two sets. Example 1: Find the mean, median, mode, and range for the following list of value The mean is commonly known as the average which is calculated by getting the sum of all values in the list and then divided by the number of entries. Thesymbol used to represent the mean is [latex]/bar X[/latex], often read as x-bar. I rounded off the final answer to the nearest whole number because all thenumbers in the set are also whole numbers. To be more specific, I rounded off the mean to the nearest ones place or digit. Rounding off is an approximation so I use the wavy equal symbol [latex] left(\approx \right)[/latex] to suggest that it is an estimate and not an exact answer. must organize the numbers from lowest to highest, and identify the middle value. In addition, since the number count of entries is odd, it is guaranteed to have a middle value. A quick shortcut to determine which entry is the median is to add the number of entries (call it [latex]/[latex]) by 1 then divide by 2. Use the output value here to count from either the left or right of the ordered list to pinpoint the exact location of the median. From our previous problem, the number in the list that appears the most, which in this case, the number 9. This number is repeated three times. We dont need to organize the list into numerical orderto find the lowest and highest values. You should be able to pick those required two values by quick inspection. Since the range is the difference between the highest and lowest value, thus, range = highest lowest = 13 1 = 12. Example 2: Find the mean, median, mode, and range for the following list of values in a set. If we list the values in numerical order, the median is found at thecentermost location. But here we have no single value at the center of the list. To address this issue, we are going to solve for the median by finding the average or mean of the two middle values. It just happens that the two center values are the same, therefore the average of two equal numbers will equal the same number. By quick inspection, we should observe that we have a tie because they both repeat three times on the list? That precisely is the case. We have a situation here where two modes exist! Some textbooks would call this set bimodal, which means having two modes. Rangee is equal to maximum value minus minimum value which gives us: 12 2 = 10. Example 3: Find the mean, median, mode and range for the following list of values are whole numbers, then it makes sense to have the final answer also expressed as a whole. Therefore, I will round it off to the nearest ones place. To solve for the median, lets arrange the list in increasing order and then pick the center value. Obviously, the median here equals 23. To solve for the mode, identify the most popular value or entry in the list. Is there an element that appears more often in the list? It is apparent that no value is repeated more often than the other. In fact, each unique number only shows up one time. So, this set has no mode. The range is the easiest to find, Range = highest value minus lowest value. This gives us RANGE = 99 13 = 86. Example 4: Find the mean, median, mode, and range for the following list of values This is an interesting example because the elements in the set now contain zeroes, a positive, and negative numbers. However, the mean, I will solve it as usual by finding its average. Since we are dealing with negative numbers, it is a good practice to place them inside the parenthesis tocaution us to be careful in combining them. Round off your answer to the negative numbers. Remember that zero is always greater than any negative numbers. More so, to compare which of the two negative numbers is greater than the other, we need to compare both using their absolute values. The negative number with the smaller absolutevalue is the larger number! It just happens that the two middle numbers are equal. Thus, their average will simply be the number itself. For the mode, find the elements of the set that appears more often. It looks like we also have a tie! Both 5 and 0 repeat themselves twice. The modes then are 5 and 0. The range is computed as follows: Remember this simple rule to prevent anyunnecessary algebraic mistakes. Example 5: Find the mean, median, mode, and range for the following list of values Thisexample contains a set wherein all numbers have two decimal places. The rule of thumb is to ensure that any results of our computations must also be rounded off to thesame decimal places. Again, it wouldn't hurt if you ask advice from your teacheron how many decimals to round off as this part of the solution may be open to different interpretations. As you can see, I rounded off the final value of the mean to two decimal places. Arrange the numbers in increasing order that is, from least to greatest. By having an even number of entries in the set suggests that we will have two middle numbers. This is always the case! You should anticipate getting the average of the two middle values to obtain the answer for the median. Here is the computation of the median After dividing the sum of two middle numbers by 2 yields an answer with two decimal places. This is perfect! No need to do some rounding off. Since each element in the set appears just once(no repeating values), we say that this set has no mode. The highest value is 56.13, while the lowest value is 9.25. The range is just the difference between them. Range = 56.13 9.25 = 46.88 Example 6: Find the mean, median, mode, and range for the following list of values By quick inspection, the values in this set contain numbers that have different decimal places. Hopefully, you start by wondering how many decimal places should we round off the final answer. Again, this is open to interpretations. Therefore, I suggest that you ask your teacher for further clarification. NOTE: For this problem though, I decided to round it off based on the number with the largest decimal places. I see that entry 0.254 contains three digits after the decimal point which is the biggest among others. So accordingly, I will keep in mind to round off the final answer to the nearest three places just like when we solved for the mean. Here is the calculation for the median We have three modes (trimodal) in this set which are 0.1, 0.254, and 1.1. They all repeat twice on the list! The maximum value in the list is 6.3, while the minimum value is 0.1. Therefore the range is computed as follows Example 7:Leroy wants to achieve an decimal overall grade of B on his quizzes. Currently, he has the following scores from his previous eleven quizzes: 75, 83, 96, 86, 69, 74, 83, 86, 90,60, and 80. What should be his next score in order to get aquiz average of 80? Let [latex]x[/latex] be the unknown test score that Leroy needs to get. In order to set up the correct average, we need to make an adjustment on the number of entries being added: that is, from 11 to 12. The working equation that can solve for the missing value of [latex]x[/latex] is the following Leroy needs to score 78% on his next quiz in order to get a quiz average of 80%. Example 8:Lisa is aware that she needs to take five major exams in the semester. Unfortunately, due to medical reasons, she is only able to take two exams with scores of 85 and 89. Toaccommodate her, the professor gives her a make-up exam to garner a 90% average in all exams? Solution: Assign a variable to the unknown score. Lets call it [latex]y[/latex]. number of exams is 5 because of her existing two exam scores which is added to the make-up exam that is counted as three test grades to achieve an overall exam of 90%. Tags: Intermediate Algebra, Lessons (a) the mean (b) the median (c) the mode (d) the range 5, 6, 2, 4, 7, 8, 3, 5, 6, 6, 6, 7, 8 As there are two middle numbers in order. 2, 3, 4, 5, 5, 6, 6, 6, 7, 8 As there are two middle numbers in this example, 5 and 6, (c) Show me From the list above it is easy to see that 6 appears more than any other number, so mode = 6 (d) Show me The range is the difference between the smallest and largest numbers, in this case 2 and 8. So the range is 8 2 = 6. Welcome to this complete step-by-step guide to central tendency and how to find the mean, median, and mode of a data set. This post will share key information, formulas, and vocabulary so that you can use math to determine the mean, median, mode, and range of any data set and understand what these values represent. After working through two examples, you will also have access to a free mean, median, and mode pdf practice worksheet that includes an answer key. Now lets go ahead and begin this lesson by raising two key questions: For a given set of data What does the mean, median, mode, and range represent? How can you find the mean, median, mode, and range of a data set? What is Central tendency and are three different ways of expressing averages of a set of data. The key term here is average. In math, central tendency is a number or value that can be used to describe a central position, or average value, within a data set. Furthermore, the range of a set of data is the difference between the highest and lowest values. With this key math vocabulary in mind, lets take a look at two examples Example 01: Find the Mean, Median Mode, and RangeFind the mean, median, mode and range of the data set: 1, 6, 7, 4, 6, 8, 3 *Before you find the mean, median, mode, and range of a data set, be sure to rewrite the list of values in either ascending (greatest to least) or descending (greatest to least) or descending (greatest to greatest) or descending (greatest to least) or descending (greatest to greatest) or descending (greatest) or descending (greatest to greatest) or descending (greatest) or descending follows: Now that we have rearranged the values of the data set in ascending order, we are ready to find values of central tendency. Step 01: Find the mean of the data set, divide the total sum by the total amount of numbers. In this example, to find the total sum, add all seven values in the data set together as follows: 1 + 3 + 4 + 6 + 6 + 7 + 8 = 35The total sum is 35.Next, divide the total amount of numbers in the data set (which, in this example is 7).35/7 = 5 >>> The mean is 5 goals per game. For future reference, here is a handy formula that you can always use to find the mean of a data set. To determine the mean, simply divide the total sum of all of the values in the data set by the total number of values as follows: The median of numbers in the data set, simply find the middle value. In this example, notice that there is an odd number of values in the data set (7 total). To find the median of numbers, start crossing the bookend values on each side of the data set as you make your way towards the middle until only one value is 6, so you can conclude that the median of the data set is equal to 6. *Note that when there is an even number of values in the data set, using this strategy to find the median will require one extra step (we will go more in depth in example 2). Median Calculator Looking for a quick way to central tendency values? This median, mode calculator from Calculator Soup) is an excellent tool for quickly finding these values. However, this website should only be used a tool for checking your work and not a substitute for understanding how to actually find the mean, median, mode, and range of a data set is the most common number. It is possible to have more than one mode, or no mode at all. If youre looking for a simple answer to how to find the mean, median, mode of a data set, then youre in the right place. To find the mode, simply look for the value that occurs the most often (i.e. the value that repeats is 6 Therefore, you can conclude that the mode for this data set is 6. Just like in example 01, you can find the mode of a data set by determining which value is the most common. You can find this value by looking for numbers that repeat. And remember that it is possible to have more than one mode at all! Step 04: Find the RangeThe range is the difference between the highest and lowest values in the data set (the largest number minus the smallest number). To calculate range math, simply determine the largest and smallest values and then find the difference by subtracting (rearranging the numbers in ascending order at the very start of this example, the largest number in the data set is 8 and the smallest number in the data set is 1. To find the range, simply perform 8 1 = 7Therefore, the range is 7 goals. Quick Summary: And now we have found all values of central tendency for this example. Here is a quick summary of what you just did!Keep in mind that the process for determining mean, median, mode, and range of any data set is pretty much always the same. So, now lets try a second example from least to greatest, which will make finding the mean, median, mode, and range much easier for you (with or without a calculator). Now you are ready to find the mean, median, mode, and range of this data set. Step 01: Determine the MeanTo find the mean of the data set, remember to apply the mean formula, where you find the total sum of all of the numbers and divide it by the total number of values in the data set. In this case 9 + 9 + 9 + 10 + 10 + 14 + 15 + 16 + 19 + 20 = 131 (the total sum)and there are 10 total numbers. 131/10 = 13.1 >>> The mean is 13.1 hours studying*Note that it will often be the case that the mean value is decimal. Remember that the median represents the middle value of a data set. To determine the median of numbers in the data set, you perform the same process of crossing out the bookend values on the left and right of the data set had an odd number of values, this data set had an odd number of values (ten in total), which means that there will one be extra step involved to find the median. After crossing out the outside values and working your way to the middle, you will notice that, because the data set has an even number of values, there are two values in the middle (in this case, 10 and 14). So, which value is the median? In cases like this, the median is the average of the two values. To find the average, simply add the two values together and divide the sum by two as follows: 10+ 14 = 24 >>> 24/2 = 12 The median of the data set is 12 hours. Remember that the mode of any data set is 12 hours. Remember that the mode of any data set is 12 hours. occur more than once: 9 and 10. In this case, 9 shows up twice. Since 9 shows up twice. Since 9 shows up more often than 10, you can conclude that 9 is the mode is 9. The last remaining measure of central tendency that you must find is the range, which is the difference between the largest number and the smallest number. To calculate range for this example, look at the data set and identify the largest value (20) and the smallest find me happily developing animated math lessons to share on my YouTube channel. Or spending way too much time at the gym or playing on my phone. 1 Comment Imagine this: your classmates have. You have 28 classmates and go around the room collecting data from each one. By the end, you have a lot of numbers written down! Those numbers represent how many pets each classmate has 4, Becka has 0, etc. However, if you want to expand on your findings and figure out things like the average number of pets people have, and more, youll need to use mean, median, mode, and range. In other words, these mathematical calculations allow people to analyze data sets and come to conclusions that can change the way they see the world! So, lets walk through how and when to use them. Measures of Central Tendency: Mean vs Median vs ModeMean, median, and mode summarize key information about the central tendency, or typical data, within a data set. This information can help mathematicians make predictions about data trends. Mean, median, and mode are three ways to calculate the average of a set of numbers. They are all measures of central tendency. Before the 2014 curriculum reforms, pupils were expected to learn about all 4 different types of average shad solve problems based on their application. But now the national curriculum only has mean as a type of average that pupils need to be explicitly taught in Year 6. Despite this, some schools continue to teach all four different averages after Year 6 have completed their end-of-year assessments. Mean, mode and medium are different types of averages from a data set. They are all calculated in different ways. FREE Mean Worksheet Ready-to-use mean worksheet for Year 6 pupils. Includes 4 arithmetic questions, 9 consolidation questions, and 1 challenge question. Download Free Now! Mean is the most common way to calculate the mean, add all the numbers in the data set. The mean is affected by outliersvalues that are much smaller or larger than the other numbers in the data set. The median is the middle value in a set of numbers ordered from least to greatest. If there are two middle numbers, the median is a better measure of central tendency than the mean. The mode is the value that appears or occurs most often in a set of numbers. To find the mode, order the values from least to greatest to see which appears the most often. Mode can also be used for non-numerical values in a set of numbers. To calculate the range, take away the smallest value in your set of values from the largest. The number you are left with is your range. Unlimited maths tutoring for primary schools with Skye, our AI voice tutor Built on the schools with Skye, our AI voice tutor Built on the same principles, pedagogy and curriculum as our traditional tutoring for primary schools with Skye, our AI voice tutor Built on the schools w already helping hundreds of primary pupils nationwide with Skyes one to one maths tutoring Find out more It is useful for pupils to be aware of mean, median, mode and range despite it not being an explicit requirement. Introducing the concepts at this stage proves useful in later years. For example, when dealing with data that contains outliers, finding the mean may not always be the best option. To find an average, you must first have a data set. The following data set is from a game a group of pupils were playing in the classroom. JasonDavidYahyahJosephineChristine7121574 To calculate the mean, median, mode and range, we need to manipulate this data using the information about how to find each particular average above. Taking the above data as an example, to find the mean you would need to add 7, 12, 15, 7 and 4 together to get 45 and then divide this by the numbers, pupils can use partitioning to help them with the calculations. Due to the amount of calculating involved in finding the mean, it is referred to as the meanest of the averages. This is one way you can remind pupils how to find the mean of a number of data points! With our set of numbers, the mode would be 7 as this appears twice in our data in the table above. Mode shares some similar orthography with the word most which can be a useful way to get pupils to remember how to find the mode. The median value is found by finding the middle value, or that he data values from the table and write them out in ascending order. Once that is done, our data looks like this: 4, 7, 7, 12, 15 The middle value, or median, is 7 as there are an equal number of other values on either side of the second 7. When your data set contains an even number of values. With our data set that would be 11, as the highest number is 15 (Yahyah) and the lowest number is 4 (Christine). To find the difference, you need to subtract the highest value from the lowest value. There is no longer a requirement for median, mode and range to be taught at the primary phase of school. Although mean is compulsory in Year 6 and comes under the statistics section of the national curriculum for mathematics, where it states that pupils should be taught to calculate and interpret the mean of a data set. Year 6 Third Space Learning lesson: finding the mean average Read more: Teaching Statistics And Data Handling KS2 While there is no requirement for it to be linked to other areas of mathematics, some teachers may choose to give tasks that find the averages of particular data sets. This could include, for example, finding the mean of certain measurable characteristics of the class. For example, hand span, height or shoe size. This data could be obtained during a statistics lesson or a less tendency to help draw conclusions from the data. People may also use the mode or modal value to estimate how long it takes them to do tasks they complete frequently. For example, if you timed yourself vacuuming where you lived and collected these times in minutes (10, 10, 8, 13, 10), you could say that it takes you around 10 minutes to hoover where you live as 10 is the value with the highest frequency in the data set. Lets look at a step-by-step mean median mode example question! JasonDavidYahyahJosephineSusanChristine81275157 Use the data above to find the mean, median, mode and range of the data. To find the mean, first, add all the data sets. To solve this we need to add 8, 12, 7, 7, 5 and 15. This is 54. Next, we divide by the number of data sets. As this data is for 6 people, the number of data sets is 6. This means we need to find the median, we need to find the median order from least to greatest. 5, 7, 7, 8, 12, 15 We then need to find the middle value. As the data set has an even number we need to find the two middle numbers, add them and divide by 2. The middle numbers (or median numbers) are 7 and 8 as there are two numbers on either side of them. Adding them up together gives us 15. 15 divided by 2 = 7.5. To find the mode, we are looking for the data that appears most often. 7 is the only whole number that appears more than once, so the mode is 7. To find the range, we subtract the lowest value from the highest. The lowest value from the highest is 15. 15 5 = 10. The range is 10. JasonDavidYahyahJosephineSusanChristineRita510481147 Use the data above, and the examples from further up the page, to find the mean, median, mode and range of the data. Answers: Mean is 7 Mode is 4 Range is 7 (11 4 = 7) Whats the difference between mean median mode and range? Mean is 7 Mode is 4 Range is 7 (11 4 = 7) Whats the difference between mean median mode and range? number, when in order. Mode is the most common number. How do you find the mean? Add all of the number in the middle of a data set. For example, in the data set: 7, 6, 9, 2, 1, the median would be 6 as the numbers would be placed in order (1, 2, 6, 7, 9), and 6 is the number in the middle.

What does mean median mode and range mean in math examples. What does mode median and range mean. What does mean median mode and range mean in math. What is mean range mode and median. Mean median mode and range explained.