|  |  |  |
| --- | --- | --- |
|  | Write in simplest index notation: |  |
|  | Write in simplest index notation: |  |
|  | Write in simplest index notation: |  |
|  | Write in simplest index notation: |  |
|  | Write in simplest index notation: |  |
|  | Solve for *x* in the equation  |  |
|  | Solve for *x* in the equation  |  |
|  | Solve for *x* in the equation  | *x* = 1 is only feasible solution |
|  | For the graph: , state the:1. asymptote
2. *y*-intercept
3. domain
4. range
 | 1. Asymptote
2. *y*-intercept: when *x* = 0,
3. Domain
4. Range
 |
|  | Evaluate:   |  |  |
|  | Evaluate:  |  |  |
|  | Simplify:   |  |  |
|  | Simplify:   |  |  |
|  | Simplify:   |  |  |
|  | Solve for *x*:  |  |  |
|  | Solve for *x*:  |  |  |
| 1.
 | Solve:  | *x* = 18 is the only solution is not possible) |  |
|  | Solve for *x* correct to 3 decimal places:  |  |  |
| **19** | Explain why tn:{3, −1.2, 0.48, …} is a geometric sequence. | Thus, it is a geometric sequence. |
|  | Find the 12th term of a geometric sequence with first term 0.3 and common ratio −2. |  |
|  | The 4th term of a geometric sequence is 2 and the 7th term is 54. Determine the first term of this sequence. |  |
|  | The 3 consecutive terms of a geometric sequence are 3.6, y, 22.5. Find the value of y. |  |
|  | Find the sum of the first 10 terms of a geometric sequence tn:{0.2, 0.6, 1.8, …}. |  |
|  | The amount of shampoo washed away from Anita’s hair after successive washes was recorded as 30 g in the first wash, 15 g in the second wash, 7.5 g in the third wash and so on. Determine the total amount of shampoo washed away after infinite washes. | The total shampoo washed away is 60 g. |
|  | Write equations to represent the following situations.1. An initial population of 16 rabbits doubles every year.
2. 120 bacteria in a cesspool double every hour.
3. An initial investment of $1200 triples every two years.
 | 1. k = 16, a = 2, N = 16(2)T
2. k = 120, a = 2, N = 120(2)T
3. k = 1200, a = 3, N = 1200(3)T
 |
|  | These data give the amount of weekly pocket money given to a student for 8 weeks:$5.80, $6.40, $5.00, $6.50, $6.80, $5.90, $6.80, $5.20.1. Find the mean of the pocket money.
2. Find the median of the pocket money.
3. Find the mode of the pocket money.
 | 1. Mean =  =  = $6.05
2. $5.00, $5.20, $5.80, $5.90, $6.40, $6.50, $6.80, $6.80 Median =  = $6.15
3. Mode = $6.80
 |
|  | This frequency table shows the sick days taken by the workers in a factory in a month.1. Find the mean number of sick days per worker.
2. Find the median number of sick days per worker.
3. Find the mode for the number of sick days.
 | 1. Mean =  = 2.3 sick days per worker.
2. Median = 2
3. Mode = 0
 |
|  | This grouped frequency table shows the area of farm lots in hectares.1. Find the mean area of the farm lot.
2. Find the median area of the farm.
3. Find the mode.
 | 1. Mean =  = 61 ha
2. Median group is 50–60 ha
3. Modal group is 50–60 ha
 |
|  | Find the range of each of the following sets of data.1. 2, 5, 4, 5, 7, 4, 3
2. 103, 108, 111, 102, 111, 107, 110
3. 2.5, 2.8, 3.4, 2.7, 2.6, 2.4, 2.9, 2.6, 2.5, 2.8
 | 1. Range = 7 – 2 = 5
2. Range = 111 – 102 = 9
3. Range = 3.4 – 2.4 = 1
 |
|  | The number of goals scored by a team is shown below:5, 4, 4, 7, 5, 9, 12, 14, 16, 16.1. Find the lower quartile.
2. Find the upper quartile.
3. Find the interquartile range
 | 4, 4, 5, 5, 7, 9, 12, 14, 16, 161. Lower quartile = 5
2. Upper quartile = 14
3. Interquartile range = 14 − 5 = 9
 |
|  | The stem-and-leaf plot below gives the exact masses of 24 packets of biscuits. Find the interquartile range of the data.Key: 248 | 4 = 284.4 gStem | Leaf 248 | 4 7 8 249 | 2 3 6 6 250 | 0 0 1 1 6 9 9  251 | 1 5 5 5 6 7  252 | 1 5 8 253 | 0 | Lower quartile = 249.6Upper quartile = 251.55Interquartile range = 251.55 – 249.6 = 1.95 |
|  | Find the standard deviation of the set of outcomes when a six-sided die is rolled as shown below. 1, 2, 3, 4, 5, 6Show your working.State your answer correct to 2 decimal places. | Mean = $\frac{\sum\_{}^{}x}{n}=\frac{21}{6}=3.5$$$σ=\sqrt{\frac{\left(1-3.5\right)^{2}+\left(2-3.5\right)^{2}+\left(3-3.5\right)^{2}+\left(4-3.5\right)^{2}+\left(5-3.5\right)^{2}+\left(6-3.5\right)^{2}}{6}}$$$$σ=\sqrt{\frac{\left(-2.5\right)^{2}+\left(-1.5\right)^{2}+\left(-0.5\right)^{2}+\left(0.5\right)^{2}+\left(1.5\right)^{2}+\left(2.5\right)^{2}}{6}}$$$$σ=\sqrt{\frac{6.26+2.25+0.25+0.25+2.25+6.25}{6}}$$$$σ=\sqrt{\frac{17.5}{6}}≈1.71$$ |
|  | A supermarket chain is analysing its sales over a week. The chain has 15 stores and the sales for each store for the past week were ( in $million):1.5 2.1 2.4 1.8 1.1 0.8 0.9 1.1 1.4 1.6 2.0 0.7 1.2 1.7 1.31. Calculate the mean sales for the week.
2. Should the population or sample standard deviation be used in this case?
3. What is the value of the appropriate standard deviation?
 | 1. = 1.44
2. Population, as the sales from every store are considered.
3. σ = 0.48
 |
|  | The following frequency distribution gives the prices paid by a car wrecking yard for a sample of 40 car wrecks.Price ($) Frequency0 – 500 2500 – 1000 41000 – 1500 81500 – 2000 102000 – 2500 72500 – 3000 63000 – 3500 3Find the mean and standard deviation of the price paid for these wrecks. |  = 1825s = 797.03 |
|  | In order to compare two textbooks, a teacher recommends one book to one class and another book to another class. At the end of the year the classes are each tested; the results are detailed below.Text A44 52 95 76 13 94 83 72 55 81 22 25 64 72 35 48 56 59 84 98 84 21 35 69 28Text B65 72 48 63 68 59 68 62 75 79 81 72 64 53 58 59 64 66 68 42 37 39 55 58 52 82 79 551. Calculate the mean and standard deviation for each group.
2. Which class performed better?
3. Which class was more consistent?
 | 1. Text A = 58.6 σ = 25.1Text B = 62.55, σ = 11.8
2. The class that used Text B, because of the higher mean.
3. The class that used Text B, because of the lower standard deviation.
 |
|  | The box-and-whisker plot drawn below shows the marks achieved by students in a class, on their end of year exam.\\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-1.jpg1. State the median.
2. Find the interquartile range.
3. What was the highest mark in the class?
 | 1. Median = 72
2. Lower quartile = 63Upper quartile = 77Interquartile range = 77 – 63 = 14
3. Top mark = 92
 |
|  | The figures below show the number of vehicles that pass through a particular intersection between 4:00 pm and 5:00 pm over a two-week period88 92 114 82 94 83 84 85 85 90 95 82 95 103 | Lower limit = 82Lower quartile = 84Median = 89Upper quartile = 95Upper limit = 114\\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-2.jpg |
|  | The data below show monthly rainfall in millimetres.Jan. 10Feb. 12Mar. 21Apr. 23May 39June 22July 15Aug. 11Sept. 22Oct. 37Nov. 45Dec. 30Draw a box-and-whisker plot of the data. | \\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-3.jpg |
|  | The number of points scored in each match by two Rugby Union teams are shown below.Team 1 : 34 32 24 25 8 18 17 23 29 40 19 42Team 2 : 23 20 35 21 46 7 9 24 27 38 41 30Display these sets of data in a back-to-back stem-and-leaf plot. | Key 3 | 4 = 34Team 1 Team 2  8 | 0 | 7 9 9 8 7 | 1 |  9 5 4 3 | 2 | 0 1 3 4 7  4 2 | 3 | 0 5 8  2 0 | 4 | 1 6 |
|  | The boxplot below shows Emma’s performance in her physics and chemistry exams.\\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-5.jpg1. State the median mark for each subject.
2. Find the range of marks in each subject.
3. Find the interquartile range for each subject.
4. In which subject did Emma perform better? Explain your answer.
 | 1. Physics = 71Chemistry  = 72
2. Physics range = 90 – 50 = 40Chemistry range = 83 – 30 = 53
3. Physics interquartile range = 76 – 66 = 10Chemistry interquartile range = 74 – 71 = 3
4. Emma performed slightly better in Chemistry, as indicated by the slightly higher median and greater consistency as shown by the low interquartile range
 |
|  | The stem-and-leaf plot below is used to display the number of vehicles sold by the Ford and Holden dealerships in a Sydney suburb each week for a three month period.Key: 1 | 5 = 15 Ford Holden 7 4 | 0 | 3 9 9 5 2 2 1 0 | 1 | 1 1 1 6 6 8 8 5 4 4 | 2 | 2 2 7 9 0 | 3 | 51. State the median of both distributions.
2. Calculate the range of both distributions.
3. Calculate the interquartile range of both distributions.
4. Show both distributions on a box-and-whisker plot.
 | 1. Ford median = 15Holden median = 16
2. Ford range = 30 – 4 = 26Holden range = 35 – 3 = 33
3. Ford : Lower quartile = 1.05 Upper quartile = 2.45 Interquartile range = 2.45 – 1.05 = 1.4
4. Holden : Lower quartile = 1.1 Upper quartile = 2.45 Interquartile range = 2.45 – 1.1 = 1.35
5. \\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-4.jpg
 |
|  | The data below show the weekly incomes for a sample of Year 11 boys and girls.Boys : $80 $110 $75 $130 $90 $125  $100 $100 $95 $115 $150Girls : $50 $80 $75 $90 $60 $250 $80 $100 $951. Find the mean of each data set.
2. Find the standard deviation of each data set.
3. Discuss whether boys or girls have a higher average weekly income.
4. Discuss whether boys or girls have a more consistent weekly income.
 | 1. Boys = $106.36Girls  = $97.78
2. Boys s = 22.48Girls s = 59.27
3. Boys have a higher average weekly income as indicated by the higher mean.
4. Boys have a more consistent weekly income as indicated by the lower standard deviation.
 |
|  | Use the data in question 9 to draw a parallel boxplot of the data clearly showing any outliers. | \\Jwbris-1\groups\Editorial and Production\Disks for dup\MATHS QUEST CDs\MQB SE Yr11 QLD CD\Art\WS10-2-6.jpgBoys: Lowest score = 75  Lower quartile = 90 Median = 100 Upper quartile = 115 Highest score = 150Girls: Lowest score = 50 Lower quartile = 67.5 Median = 80 Upper quartile = 97.5 Highest value = 100 (ignoring outlier) Outlier = 250 |