



Algebra1Coach.com

Box-and-Whisker Plots

Unit 12 Lesson 4

Box-and-Whisker Plots

Students will be able to:

Present and analyze data by using box-and-whiskers plots.

Key Vocabulary:

- Quartile
- Median
- Boxplots



Boxplots (or box-and-whisker and diagram)

Boxplots are graphs that are useful for revealing central tendency, and spread of data, the distribution of the data, and the presence of outliers (extreme scores).

To construct a boxplot requires that we obtain the minimum of score of the first quarter, the median or second quarter, the third quarter and the maximum score.

Box-and-Whisker Plots

Boxplots (or box-and-whisker and diagram)

The Median is used to reveal the central tendency and the quartiles are used to reveal the spread of the distribution.

Boxplots don't show detailed information unlike other graph. However, boxplots are useful when comparing two or more data sets.

Quartiles of Ungroup Data

Quartiles divide a distribution into four equal parts.

Q_3 is the 3rd quartile. $Q_3 = \frac{3N}{4}$

This means that 75% of the observations lie below this value.

Q_2 is the 2nd quartile. $Q_2 = \frac{2N}{4}$

Q_1 is the 1st quartile. $Q_1 = \frac{N}{4}$

Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The following data are scores 1st year students of class S in the science quiz. Draw a box-and-whisker plots

12, 11, 13, 14, 15, 17, 12, 10, 15, 16 and 15

Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The following data are scores 1st year students of class S in the science quiz. Draw a box-and-whisker plots

12, 11, 13, 14, 15, 17, 12, 10, 15, 16 and 15

Solution:

Number of frequencies: 11

Arrange the data from ascending:

10, 11, 12, 12, 13, 14, 15, 15, 15, 16, 17

$$Q_1 = \frac{11}{4} = 2.75 \text{ or } 3 \quad Q_2 = \frac{2(11)}{4} = 5.5 \text{ or } 6 \quad Q_3 = \frac{3(11)}{4} = 8.25 \text{ or } 8$$

Box and Whisker Plots

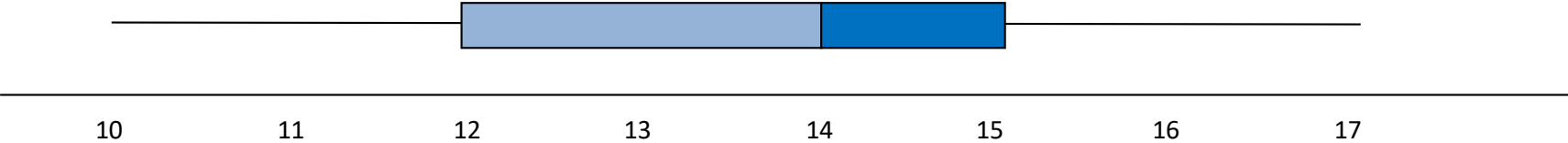
Sample Problem 1 Solve a problem involving box-and-whisker plots.

The following data are scores 1st year students of class S in the science quiz. Draw a box-and-whisker plots

12, 11, 13, 14, 15, 17, 12, 10, 15, 16 and 15

$$Q_1 = \frac{11}{4} = 2.75 \text{ or } 3 \quad Q_2 = \frac{2(11)}{4} = 5.5 \text{ or } 6 \quad Q_3 = \frac{3(11)}{4} = 8.25 \text{ or } 8$$

10, 11, 12, 12, 13, 14, 15, 15, 15, 16, 17



Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The distribution of the student's Scores in a Statistics Examination.
Draw a box and whisker plots.

x	Frequency
10	7
11	12
20	20
24	12
33	5
Total	56

Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The distribution of the student's Scores in a Statistics Examination.
Draw a box and whisker plots.

x	Frequency	
10	7	7
11	12	19
20	20	39
24	12	51
33	5	56
Total	56	

Add the frequency by ascending order up to the total frequency

Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The distribution of the student's Scores in a Statistics Examination.
Draw a box and whisker plots.

x	Frequency	
10	7	7
11	12	19
20	20	39
24	12	51
33	5	56
Total	56	

$Q_1 = \frac{56}{4} = 14$ The 14th score is 11

$Q_2 = \frac{2(56)}{4} = 28$ The 28th score is 20

$Q_3 = \frac{3(56)}{4} = 42$ The 42th score is 24

Box and Whisker Plots

Sample Problem 1 Solve a problem involving box-and-whisker plots.

The distribution of the student's Scores in a Statistics Examination.
Draw a box and whisker plots.

$$Q_1 = \frac{56}{4} = 14$$

The 14th score is 11

$$Q_2 = \frac{2(56)}{4} = 28$$

The 28th score is 20

$$Q_3 = \frac{3(56)}{4} = 42$$

The 42th score is 24

