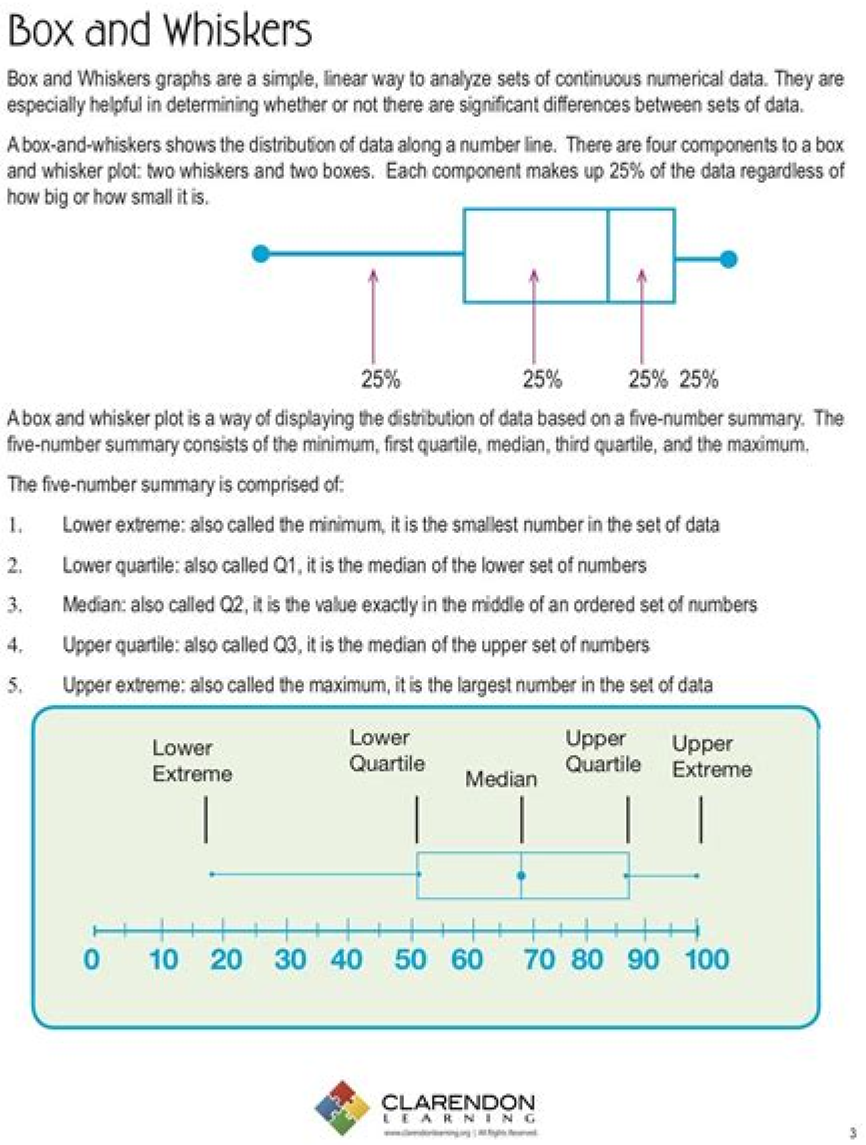
Box And Whisker Plot Worksheet With Answers



Box and Whiskers

Box and Whiskers graphs are a simple, linear way to analyze sets of continuous numerical data. They are especially helpful in determining whether or not there are significant differences between sets of data.

A box-and-whiskers shows the distribution of data along a number line. There are four components to a box and whisker plot: two whiskers and two boxes. Each component makes up 25% of the data regardless of how big or how small it is.

25%

25%

25% 25%

A box and whisker plot is a way of displaying the distribution of data based on a five-number summary. The five-number summary consists of the minimum, first quartile, median, third quartile, and the maximum.

The five-number summary is comprised of:

1. Lower extreme: also called the minimum, it is the smallest number in the set of data
2. Lower quartile: also called Q1, it is the median of the lower set of numbers
3. Median: also called Q2, it is the value exactly in the middle of an ordered set of numbers
4. Upper quartile: also called Q3, it is the median of the upper set of numbers
5. Upper extreme: also called the maximum, it is the largest number in the set of data

CLARENDON LEARNING

3

Box and whisker plot worksheet with answers is an essential educational resource for students learning about data visualization and statistics. A box and whisker plot, also known as a box plot, is a standardized way of displaying the distribution of data based on a five-number summary: minimum, first quartile (Q1), median, third quartile (Q3), and maximum. This article will provide a comprehensive overview of box and whisker plots, how to create them, and a worksheet with answers for practice.

Understanding Box and Whisker Plots

A box and whisker plot provides a visual representation of the spread and center of a dataset. It helps in understanding how data is distributed, identifying outliers, and comparing different sets of data. Here are the key components of a box and whisker plot:

Components of a Box and Whisker Plot

1. Minimum: The smallest data point in the dataset.
2. First Quartile (Q1): The median of the lower half of the dataset, which represents the 25th percentile.
3. Median: The middle value of the dataset when sorted in ascending order.
4. Third Quartile (Q3): The median of the upper half of the dataset, representing the 75th percentile.
5. Maximum: The largest data point in the dataset.

How to Create a Box and Whisker Plot

Creating a box and whisker plot involves several steps. Below is a step-by-step guide to constructing one:

Step-by-Step Construction

1. Organize the Data: Begin by sorting your data in ascending order.
2. Calculate the Five-Number Summary:
- Identify the minimum and maximum values.
- Calculate the median.
- Determine Q1 and Q3.
3. Draw a Number Line: Create a horizontal line that will serve as the base of the box plot.
4. Draw the Box:
- Mark Q1 and Q3 on the number line.
- Draw a box from Q1 to Q3.
5. Mark the Median: Draw a line inside the box at the median value.
6. Draw the Whiskers:
- Extend lines (whiskers) from Q1 to the minimum and from Q3 to the maximum.
7. Identify Outliers: Mark any data points that fall outside of 1.5 times the interquartile range (IQR) as outliers.

Example Data Set

Consider the following dataset representing the ages of participants in a study:

34, 23, 45, 29, 41, 36, 38, 30, 50, 27

Calculating the Five-Number Summary

1. Organize the Data:
- Sorted data: 23, 27, 29, 30, 34, 36, 38, 41, 45, 50
2. Minimum: 23
3. Maximum: 50
4. Median: The median is the average of the 5th and 6th values (34 and 36), so Median = (34 + 36) / 2 = 35.
5. Q1: The median of the first half (23, 27, 29, 30) is (27 + 29) / 2 = 28.
6. Q3: The median of the second half (36, 38, 41, 45, 50) is (41 + 45) / 2 = 43.

The five-number summary is:
- Minimum: 23
- Q1: 28
- Median: 35
- Q3: 43
- Maximum: 50

Creating the Box and Whisker Plot

Using the five-number summary, we can now create the box and whisker plot.

1. Draw a horizontal line to represent the values from the minimum (23) to the maximum (50).
2. Mark the quartiles and median on this line:
- Draw a box from Q1 (28) to Q3 (43).
- Inside the box, draw a line at the median (35).
3. Draw whiskers from the minimum (23) to Q1 (28) and from Q3 (43) to the maximum (50).
4. No outliers exist in this dataset.

Worksheet: Box and Whisker Plot Practice

To reinforce your understanding, here is a worksheet for you to practice creating box and whisker plots.

Dataset 1

Ages of students in a classroom:
25, 30, 32, 29, 35, 40, 27, 22, 33, 31

Questions

1. Calculate the five-number summary.
2. Construct a box and whisker plot based on your calculations.

Dataset 2

Scores on a test:
78, 85, 92, 88, 76, 95, 81, 89, 73, 90

Questions

1. Calculate the five-number summary.
2. Construct a box and whisker plot based on your calculations.

Answers to the Worksheet

Let’s provide the answers for the worksheets above to check your understanding.

Answers for Dataset 1

1. Five-Number Summary:
- Sorted data: 22, 25, 27, 29, 30, 31, 32, 33, 35, 40
- Minimum: 22
- Maximum: 40
- Median: (30 + 31) / 2 = 30.5
- Q1: (27 + 29) / 2 = 28
- Q3: (32 + 33) / 2 = 32.5

2. Box and Whisker Plot:
- The box extends from Q1 (28) to Q3 (32.5) with a median line at 30.5 and whiskers extending to the minimum (22) and maximum (40).

Answers for Dataset 2

1. Five-Number Summary:
- Sorted data: 73, 76, 78, 81, 85, 88, 89, 90, 92, 95
- Minimum: 73
- Maximum: 95
- Median: (85 + 88) / 2 = 86.5
- Q1: (78 + 81) / 2 = 79.5
- Q3: (89 + 90) / 2 = 89.5

2. Box and Whisker Plot:
- The box extends from Q1 (79.5) to Q3 (89.5) with a median line at 86.5 and whiskers extending to the minimum (73) and maximum (95).

Conclusion

Box and whisker plots are powerful tools for visualizing the distribution of a dataset. By learning to construct and interpret these plots, students can gain valuable insights into the data's spread, center, and variability. The provided worksheet with answers can serve as a practical exercise to reinforce these concepts and help develop statistical literacy. Understanding how to read and create box and whisker plots is a vital skill in mathematics, statistics, and various fields that rely on data analysis.

Frequently Asked Questions

What is a box and whisker plot, and what does it represent?

A box and whisker plot, also known as a box plot, is a graphical representation of a dataset that displays its minimum, first quartile, median, third quartile, and maximum. It helps visualize the distribution, central tendency, and variability of the data.

How do you interpret the different parts of a box and whisker plot?

In a box and whisker plot, the box represents the interquartile range (IQR), which contains the middle 50% of the data. The line inside the box indicates the median. The 'whiskers' extend from the box to the minimum and maximum values, showing the full range of the data, excluding outliers.

What are the steps to create a box and whisker plot from a dataset?

To create a box and whisker plot, first, organize the data in ascending order. Then, calculate the minimum, maximum, median, first quartile (Q1), and third quartile (Q3). Construct the box using Q1, Q3, and the median, and draw whiskers to the minimum and maximum values.

Can a box and whisker plot display outliers, and if so, how?

Yes, a box and whisker plot can display outliers. Outliers are typically represented as individual points beyond the whiskers. They are often determined using a calculation based on 1.5 times the interquartile range (IQR) above Q3 and below Q1.

Where can I find worksheets with box and whisker plot problems and answers?

Worksheets with box and whisker plot problems and answers can be found on educational websites, math resource sites, and platforms providing printable worksheets for teachers and students. They often include example problems, step-by-step solutions, and practice questions.

Find other PDF article:
https://soc.up.edu.ph/22-check/Book?docid=oKU27-7798&title=first-practice-basketball-drills.pdf

Box And Whisker Plot Worksheet With Answers

F1车手进站时为什么喊Box? - 知乎
“Box? 不是盒子的意思么? ” 不知道大家有没有注意过，车组召回车手进站或是车手主动要求进站时，都会在TR里喊“box box”。我是听错了吗? 上小学前我就知道英语单词BOX的意思是盒子 …

『Core Ultraお前もか。。。』インテル Core Ultra 7 265K BOX の …
Oct 25, 2024 · この製品の最安価格を見るインテル Core Ultra 7 265K BOX 最安価格（税込）: ¥46,480 発売日: 2024年10月25日 価格.comの安さの理由は?

価格.com - ホンダ N-BOX JOY のクチコミ掲示板
Oct 15, 2024 · ホンダ N-BOX JOYについての情報を交換するなら、日本最大級の「価格.com クチコミ掲示板」で。交わされる情報の量と質は日本屈指のハイレベル!

【实测月更】**2025**年机械键盘选购指南，入坑必看！玩游戏、码字 **…**
【实测月更】2025年机械键盘选购指南，入坑必看！玩游戏、码字办公用什么机械键盘好? ROG、Cherry樱桃、VGN、京东京造、罗技、雷蛇等机械键盘、客制化键盘选购攻略 2780 …

『265Kと265(無印)どちらを選ぶか』インテル Core Ultra 7 265K …
Oct 25, 2024 · 「Core Ultra 7 265K BOX」のクチコミ掲示板に ナイスクチコミ 9 返信 9 お気に入りに追加 265Kと265 (無印)どちらを選ぶか 2025/05/19 05:55（2ヶ月以上前） CPU > イン …

英文地址怎么填写? **-** 知乎
此处罗列翻译成英文地址的方法和技巧，约3分钟掌握：中文地址的排列顺序是由大到小，如：X国X省X市X区X路X号；而英文地址则刚好相反，是由小到大；如上例写成英文就是：X …

価格.com - AMD Ryzen 5 9600X BOX のクチコミ掲示板
Aug 20, 2024 · AMD Ryzen 5 9600X BOXについての情報を交換するなら、日本最大級の「価格.com クチコミ掲示板」で。交わされる情報の量と質は日本屈指のハイレベル!

磁轴是什么? 为什么说磁轴是物理外挂? 磁轴与传统轴体的区别是 …
Jun 4, 2024 · 超低延迟：磁轴不是机械特性的按键，按下就发送命令，几乎完全没有延迟时间，最低目前可以做到1ms！顺滑：因为不需要考虑机械轴的金属弹片，只需要直上直下，因此磁轴 …

PS5、Switch、Xbox全方位对比，家用游戏机入门必看

May 24, 2025 · 本世代游戏机发布之后，家用游戏机的格局发生了很大变化，本文也对应做了更新，删减了PS4、Xbox One的相关信息，补充了Xbox Series X / S 、PS5 光驱版 / 数字版 ...

価格.com - 『EGRバルブ制御プログラムを書き換え』_ホンダ N ...

Feb 24, 2025 · N-BOXのリコール対象となっておりましたので、とりあえずECUのプログラム書き換えをしてもらいました。 2020年初回登録車で、かつちょい乗りが多いのでそうと錆び ...

F1车手进站时为什么喊**Box? -** 知乎

“Box? 不是盒子的意思么？” 不知道大家有没有注意过，车组召回车手进站或是车手主动要求进站时，都会在TR里喊“box box”。我是听错了吗？上小学前我就知道英语单词BOX的意思是盒子啊，上小学之后我又学会了BOX也有拳击的意思，那进站换胎和盒子拳击有毛线关系？简直不要太奇 ...

『*Core Ultra*お前もか。。。』インテル *Core Ultra 7 265K BOX*

Oct 25, 2024 · この製品の最安価格を見る インテル Core Ultra 7 265K BOX 最安価格（税込）： ¥46,480 発売日: 2024年10月25日 価格.comの安さの理由は？

価格.com - ホンダ N-BOX JOY のクチコミ掲示板

Oct 15, 2024 · ホンダ N-BOX JOYについての情報を交換するなら、日本最大級の「価格.com クチコミ掲示板」で。交わされる情報の量と質は日本屈指のハイレベル！

【实测月更】**2025**年机械键盘选购指南，入坑必看！玩游戏、码 **...**

【实测月更】2025年机械键盘选购指南，入坑必看！玩游戏、码字办公用什么机械键盘好？ROG、Cherry樱桃、VGN、京东京造、罗技、雷蛇等机械键盘、客制化键盘选购攻略 2780 赞同 1822 评论 4458 收藏

『**265K**と**265(**無印**)**どちらを選ぶか』インテル **Core Ultra 7 ...**

Oct 25, 2024 · 「Core Ultra 7 265K BOX」のクチコミ掲示板に ナイスクチコミ 9 返信 9 お気に入りに追加 265Kと265 (無印)どちらを選ぶか 2025/05/19 05:55（2ヶ月以上前） CPU > インテル > Core Ultra 7 265K BOX えまここ さん クチコミ投稿数： 8件 スレッドの最後へ

英文地址怎么填写？ - 知乎

此处罗列翻译成英文地址的方法和技巧，约3分钟掌握：中文地址的排列顺序是由大到小，如：X国X省X市X区X路X号；而英文地址则刚好相反，是由小到大；如上例写成英文就是：X号，X路，X区，X市，X省，X国。

価格.com - AMD Ryzen 5 9600X BOX のクチコミ掲示板

Aug 20, 2024 · AMD Ryzen 5 9600X BOXについての情報を交換するなら、日本最大級の「価格.com クチコミ掲示板」で。交わされる情報の量と質は日本屈指のハイレベル！

磁轴是什么？为什么说磁轴是物理外挂？磁轴与传统轴体的区别是 ...

Jun 4, 2024 · 超低延迟：磁轴不是机械特性的按键，按下就发送命令，几乎完全没有延迟时间，最低目前可以做到1ms！顺滑：因为不需要考虑机械轴的金属弹片，只需要直上直下，因此磁轴键盘都是非常顺滑。寿命长：因为采用电磁特性，没有机械轴的物理损耗，因此寿命比机械轴更长。

PS5、Switch、Xbox全方位对比，家用游戏机入门必看

May 24, 2025 · 本世代游戏机发布之后，家用游戏机的格局发生了很大变化，本文也对应做了更新，删减了PS4、Xbox One的相关信息，补充了Xbox Series X / S 、PS5 光驱版 / 数字版、Switch OLED等新机型的相关介绍，方便大家进行对比和选择。

価格*.com* - 『*EGR*バルブ制御プログラムを書き換え』ホンダ *N ...*

Feb 24, 2025 · N-BOXのリコール対象となっておりましたので、とりあえずECUのプログラム書き換えをしてもらいました。 2020年初回登録車で、かつちょい乗りが多いのでそうと錆びているのかも？

Unlock the secrets of data analysis with our box and whisker plot worksheet with answers. Master

this essential tool today! Learn more and enhance your skills.

Back to Home