

BOX PLOTS

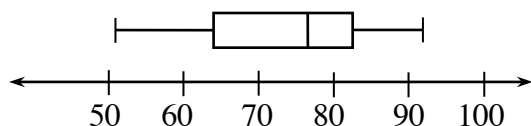
One way to display a distribution of one-variable numerical data is with a box plot. A box plot is the only display of data that clearly shows the median, quartiles, range, and outliers of a data set.

Example 1

Display this data in a box plot:

51, 55, 55, 62, 65, 72, 76, 78, 79, 82, 83, 85, 91, and 93.

- Since this data is already in order from least to greatest, the range is $93 - 51 = 42$. Thus you start with a number line with equal intervals from 50 to 100.
- The median of the set of data is 77. A vertical segment is drawn at this value above the number line.
- The median of the lower half of the data (the first quartile) is 62. A vertical segment is drawn at this value above the number line.
- The median of the upper half of the data (the third quartile) is 83. A vertical segment is drawn at this value above the number line.
- A box is drawn between the first and third quartiles.
- Place a vertical segment at the minimum value (51) and at the maximum value (93). Use a line segment to connect the minimum to the box and the maximum to the box.

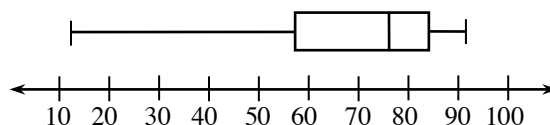


Example 2

Display this data in a box plot:

62, 65, 93, 51, 12, 79, 85, 55, 72, 78, 83, 91, and 76.

- Place the data in order from least to greatest: 12, 51, 55, 62, 65, 72, 76, 78, 79, 83, 85, 91, 93. The range is $93 - 12 = 81$. Thus you want a number line with equal intervals from 10 to 100.
- Find the median of the set of data: 76. Draw the line segment.
- Find the first quartile: $55 + 62 = 117$; $117 \div 2 = 58.5$. Draw the line segment.
- Find the third quartile: $83 + 85 = 168$; $168 \div 2 = 84$. Draw the line segment.
- Draw the box connecting the first and third quartiles. Place a line segment at the minimum value (12) and a line segment at the maximum value (93). Connect the minimum and maximum values to the box.



Problems

Create a box plot for each set of data.

- 45, 47, 52, 85, 46, 32, 83, 80, and 75.
- 75, 62, 56, 80, 72, 55, 54, and 80.
- 49, 54, 52, 58, 61, 72, 73, 78, 73, 82, 83, 73, 61, 67, and 68.
- 65, 35, 48, 29, 57, 87, 94, 68, 86, 73, 58, 74, 85, 91, 88, and 97.
- 265, 263, 269, 259, 267, 264, 253, 275, 264, 260, 273, 257, and 291.
- 48, 42, 37, 29, 49, 46, 38, 28, 45, 45, 35, 46.25, 34, 46, 46.5, 43, 46.5, 48, 41.25, 29, and 47.75.

Answers

