Warm Up

Use the data below for Questions 1-4.
14, 25, 37, 53, 26, 12, 70, 31

1. What is the mean? 33.5

2. What is the median? 28.5

3. What is the mode? none

4. What is the range? 58

Box and Whiskers

Essential Question:

How do you use box-and-whisker plots to describe data?

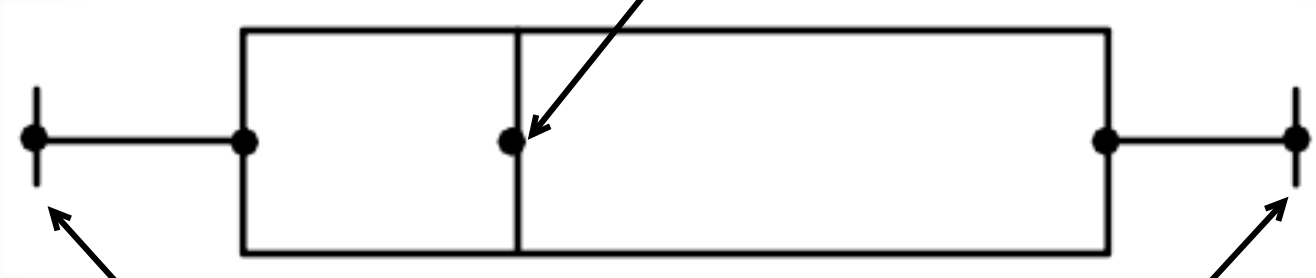
Standard:

MCC7.SP.4: Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

A box-and-whiskers plot is a good way to show the **spread (or variation) of a set of data visually.**

A box-and-whiskers plot shows both the **median** and **extremes** of a data set.

Median: the middle term, or the average of the two middle terms, when the terms are arranged from least to greatest.



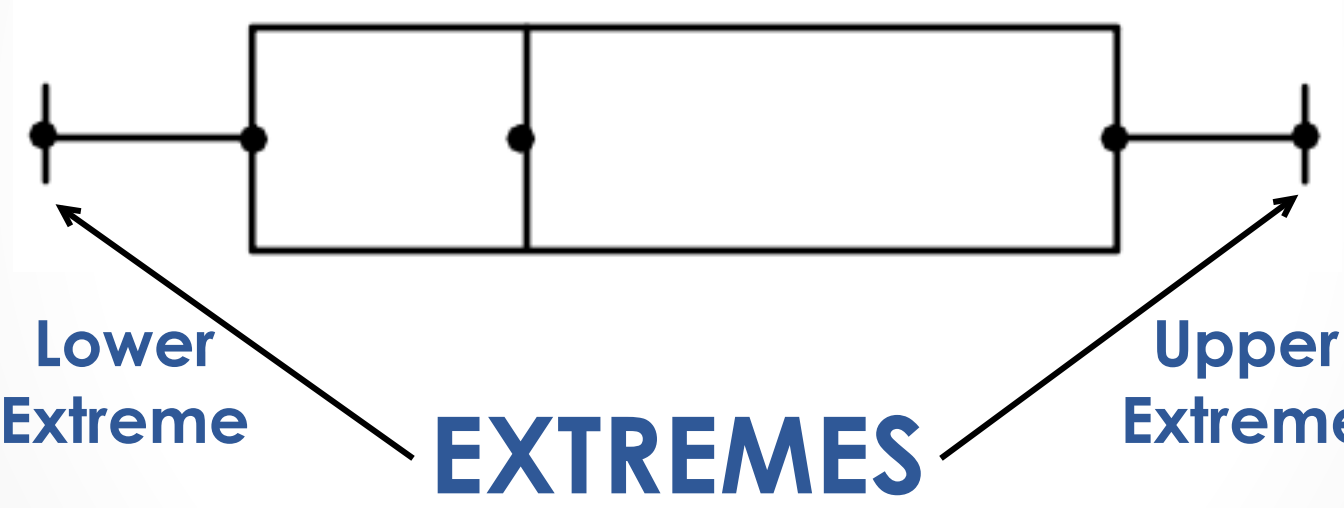
Lower Extreme

Upper Extreme

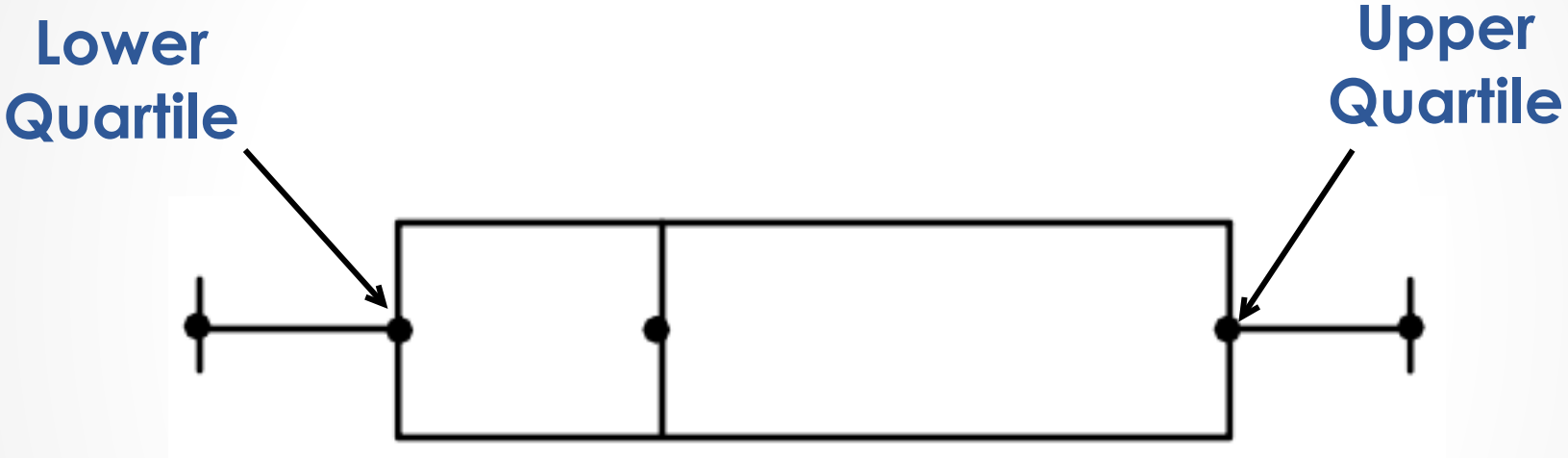
Extremes: the minimum and maximum values

The extreme values are used to find the **range** of the set of data by finding the difference between the lower extreme and the upper extreme.

Upper Extreme – Lower Extreme = RANGE

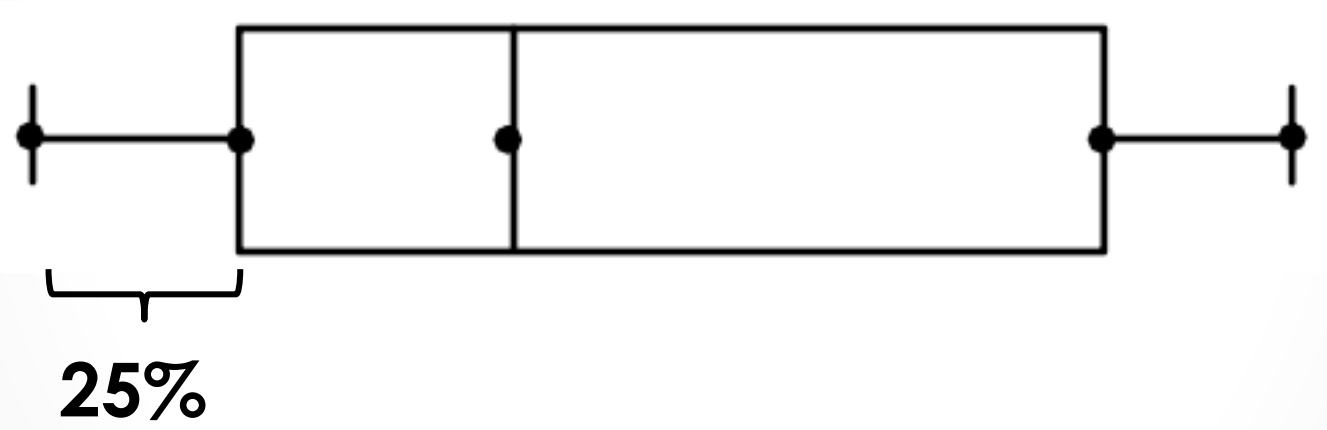


Quartiles: the medians of the lower and upper halves of the data.



Upper Quartile – Lower Quartile= INTERQUARTILE RANGE

Box-and-whiskers plots are uniform in the use of the box. **Therefore, no matter the size of each section, the data is evenly divided in quarters (25%).**



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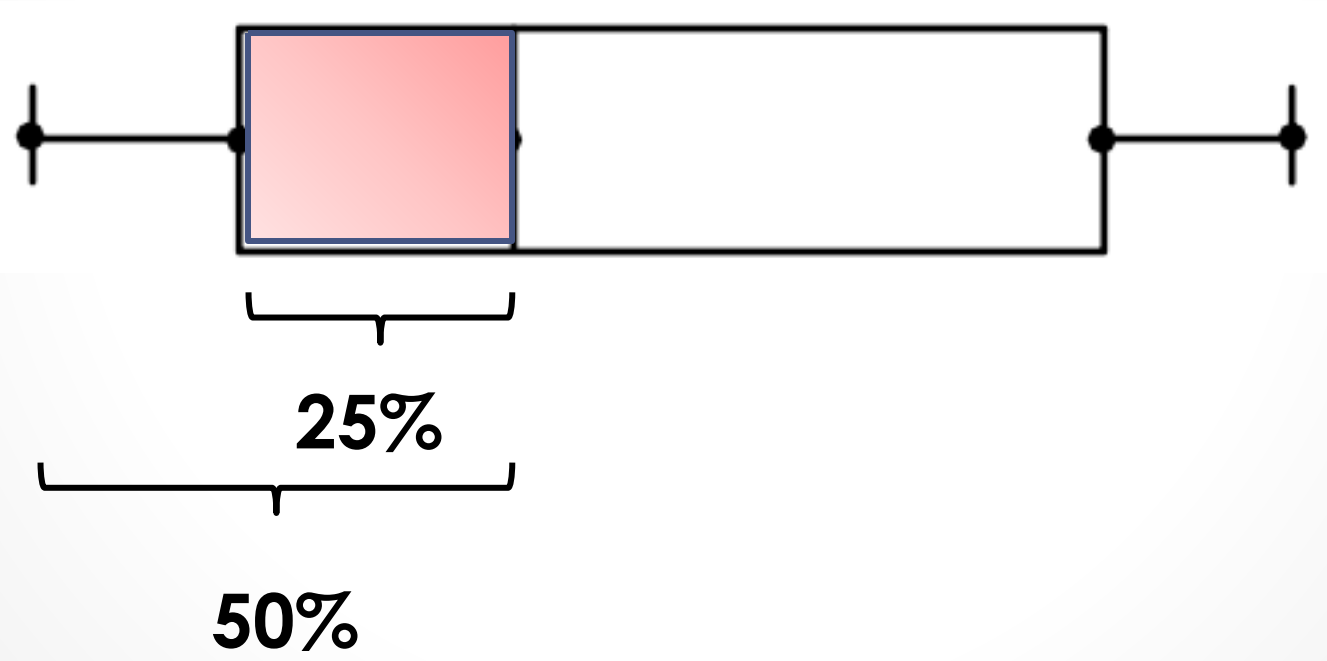

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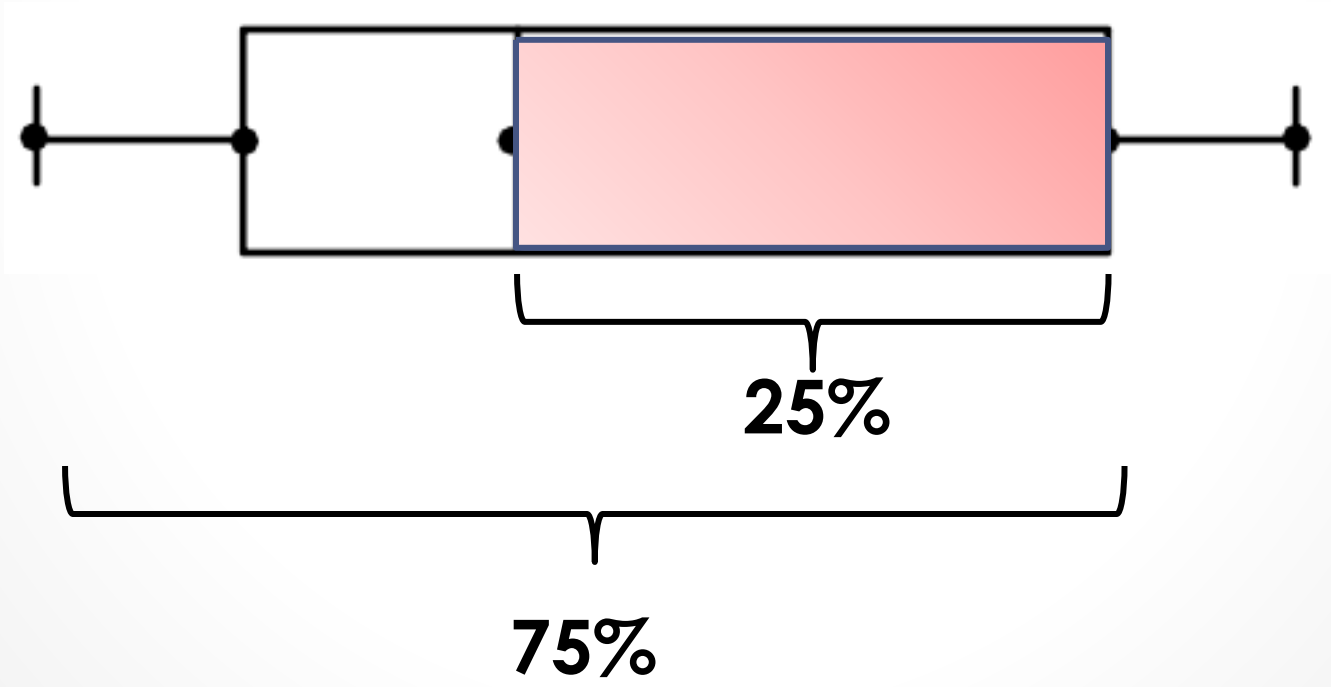
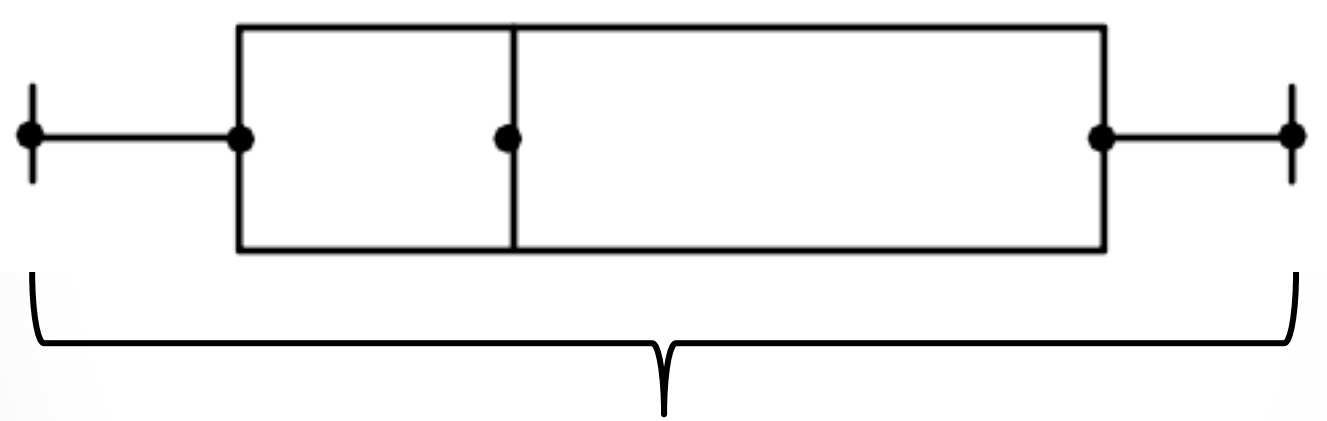
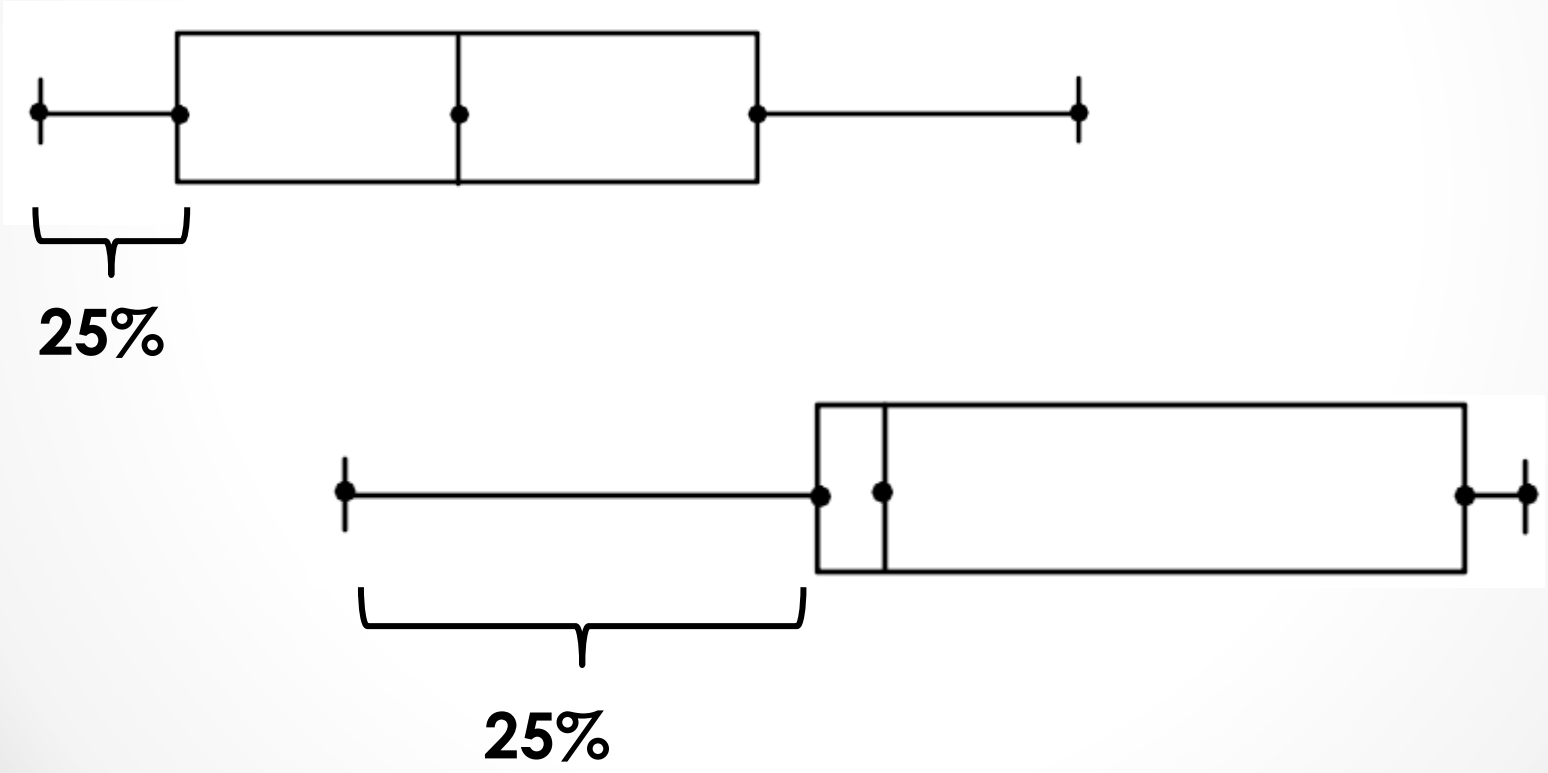


Therefore the entire box-and-whiskers plot is equal to



100% of the data.

No matter how the diagram appears to be equally or unequally divided, **each section is always 25%**



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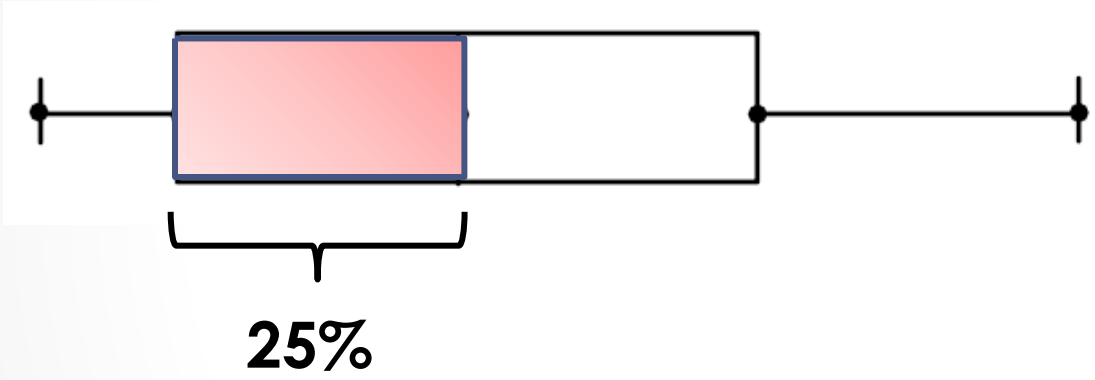

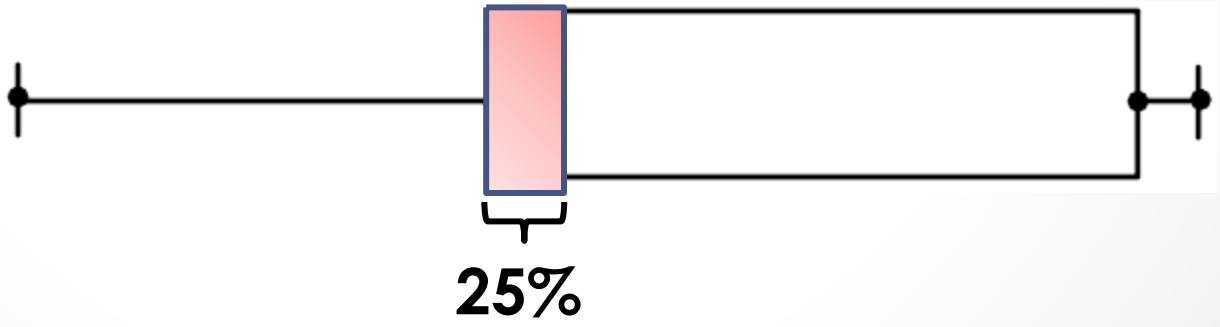

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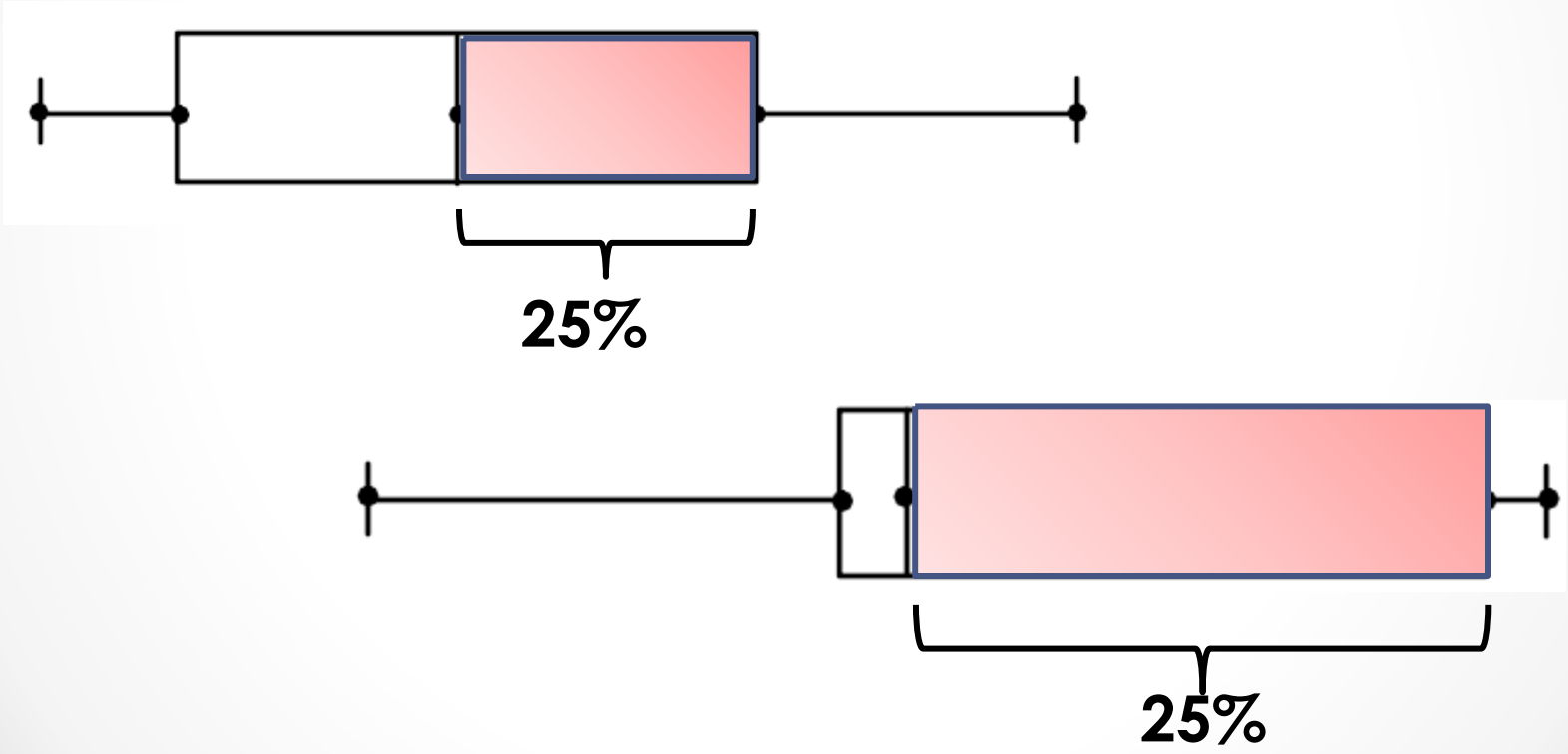

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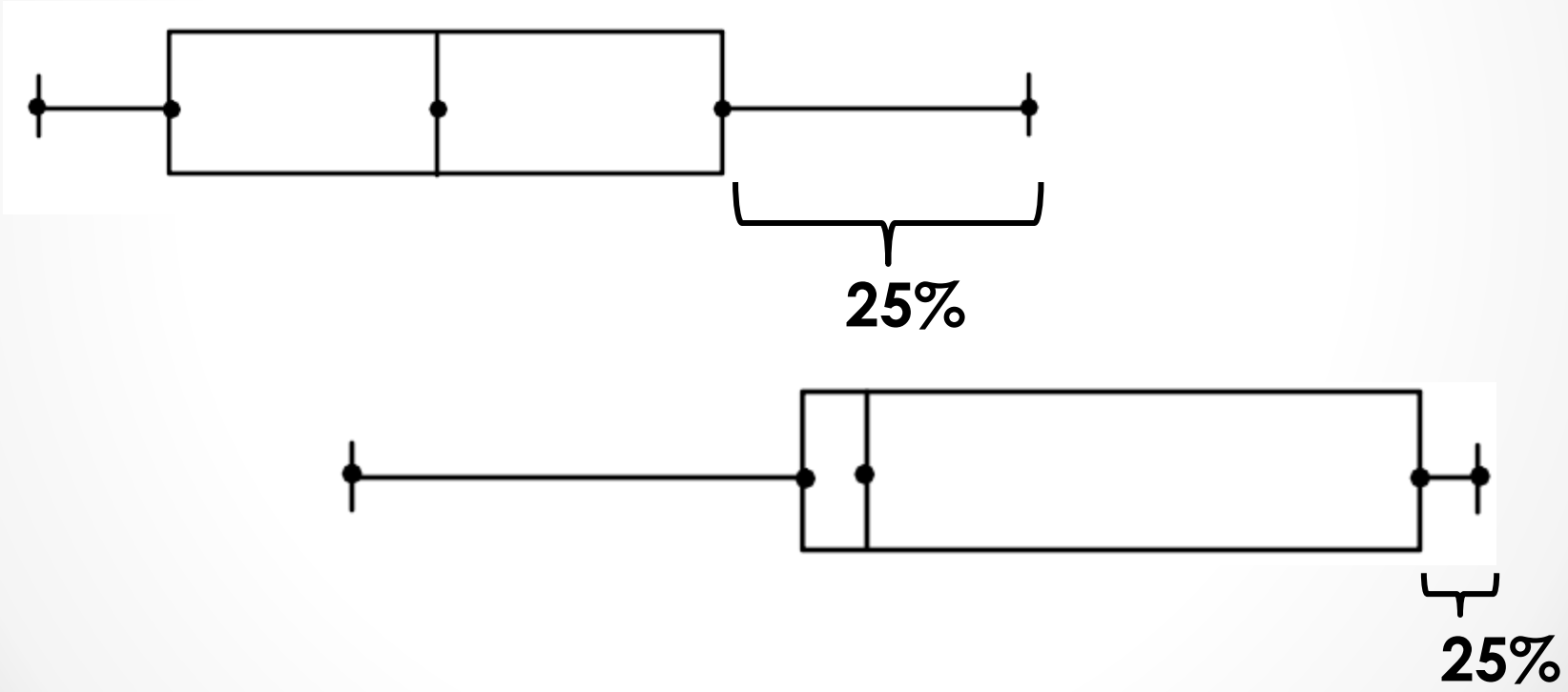
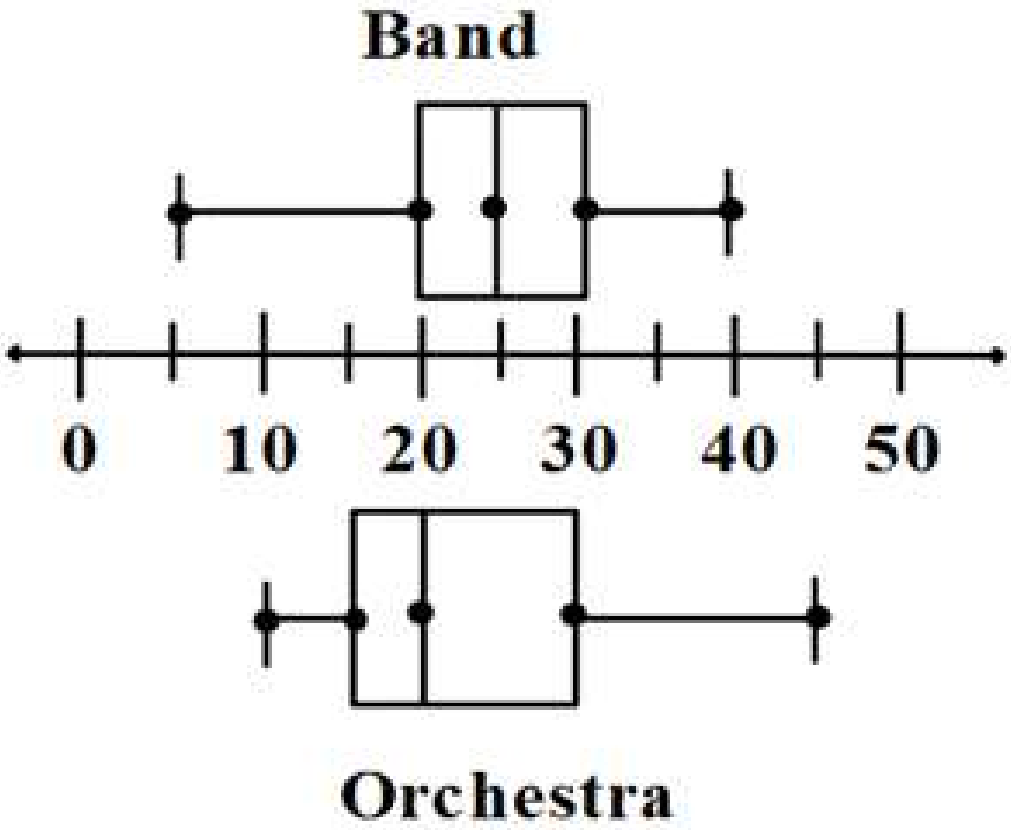


Mr. Patterson surveyed members of the school band and members of the school orchestra to find out how many CDs each owned. His data is shown in the box-and-whiskers plot on the left.



a) Which group has a higher percent of members with 20-30 CDs?

The band

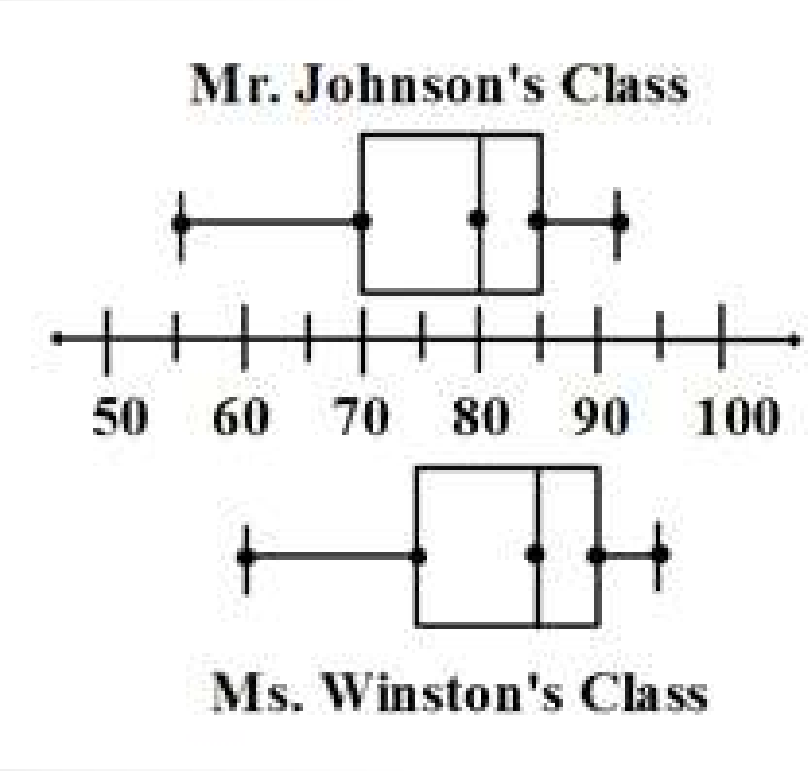
b) Which group has the higher range?

Equal!

c) Which group has the higher interquartile range?

The orchestra

The double box-and-whiskers plot below shows the test scores for two classes.



a) Which class had the lowest test grade and what was the score?

55 in Mr. Johnson's class

b) Which class had the higher median and what was it?

85 in Ms. Winston's class

c) If 80 is a passing grade, which class had the higher percent of students who passed? Explain your answer.

Ms. Winston's class. Mr. Johnson had 50% passers and Ms. Winston had over 50% passers.

Find the 5 number summary of the data.

15 14 11 9 18 18 17 15 12 8 7 12 13 9 14 19

1. List from least to greatest.

7 8 9 9 11 12 12 13 14 14 15 15 17 18 18 19

10 13.5 16

2. Find the median, place a box around it.
3. Find the middle of the lower half (the lower quartile), circle it.
4. Find the middle of the upper half (the upper quartile), circle it.
5. Under line the lowest and highest numbers (Extremes)

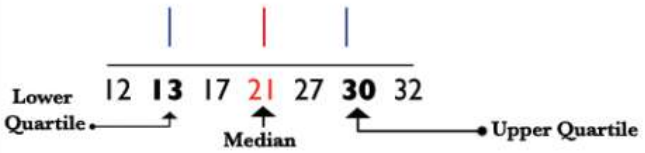
your way to making your very own plot!

How to make a Box - and -Whisker plot:

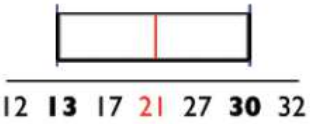
1. First draw a number line that extends far enough to include all the numbers in your data.

12 13 17 21 27 30 32

2. Next draw a line on your median as well as the upper and lower quartiles you calculated before drawing your number line.



3. Proceed to simply drawing a box using the quartiles as ending points.



4. Finally, draw the whiskers that should extend to your data's highest and lowest number.

Making a Box - and - Whisker plot with an even number set:

1. To find the median, first add the two middle numbers and then proceed to dividing the sum by two.

2 6 7 10 20 35 36 39

↓

10 + 20 = 30

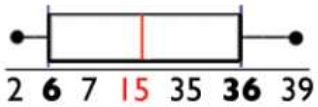
↓

30/2 = **15** ← **Your median**

2. With your new set of numbers proceed to the same instructions above to complete your Box - and - Whisker plot

2 6 7 15 35 36 39

↓



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More worksheets at www.education.com/worksheets

Glue into your notebook.

Complete this on graph paper. You will glue this into your notebook.

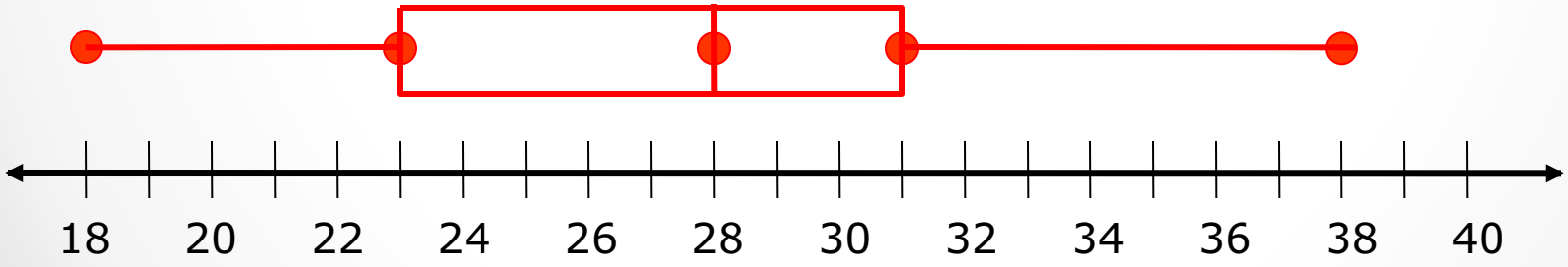
Use the data for Questions 1-3.

24, 20, 18, 25, 22, 32, 30, 29, 35, 30, 28, 24, 38

1. Create a box-and-whisker plot for the data.

2. What is the range? 20

3. What is the upper quartile? 31



Worksheet for homework.