Name: _____ Date: _____

QUARTILES AND BOX PLOTS
N-GEN MATH® 7

In 6th grade math, you saw how a data set could be divided into **quarters** by the median and the **lower** and **upper quartiles** (also known as the first and third quartiles).

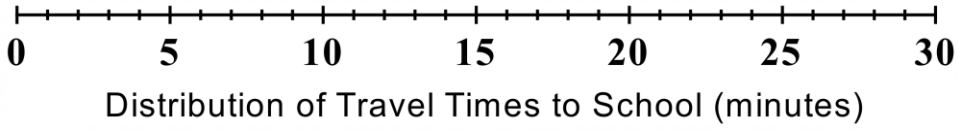
***Exercise* #1:** Scarlett is trying to determine how long it takes students in her school to travel from home to school in the morning. She takes a random sample of 15 students and asks them to record the number of minutes it takes to get to school. Her data set is shown below in ascending order.

4, 7, 7, 8, 11, 12, 12, 14, 14, 15, 19, 21, 23, 25, 28

(a) Find the median of the data set.

(b) Find the first and third quartiles.

(c) Draw a box plot (also known as a box and whiskers plot) using the number line below.



Distribution of Travel Times to School (minutes)

(d) What is the **interquartile range** (the **IQR**) for this data set?

(e) What does the **interquartile range** tell you about a data set?

Like the median, quartiles can be a bit tricky if there are an even number of values in the data set.

***Exercise* #2:** Santiago is interested in determining how many texts students in his class send out on a school night. He asks eight people to record the number of texts they sent on a Monday night. His data set is below.

3, 4, 7, 9, 9, 10, 10, 12

(a) Determine the five-number summary for this data set (min, max, first quartile, third quartile, and median). Label each value.

(b) What is the interquartile range for the data set?

(c) Find the mean absolute deviation of this data set. Show the calculations that lead to your answer.

(d) In many data distributions, **the MAD is slightly more than half of the interquartile range**. Is this true for this data set? Explain.

***Exercise* #3:** Given the data set below find the IQR and the MAD.

12, 15, 18, 21, 25, 29

Name: _____ Date: _____

QUARTILES AND BOX PLOTS
N-GEN MATH® 7 HOMEWORK

FLUENCY

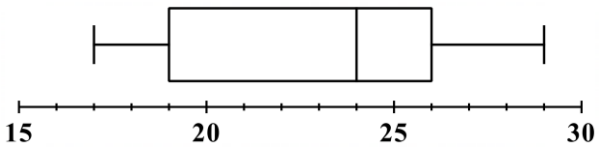
1. Given the box plot shown below, which of the following is the value of the first quartile?

   (1) 17

   (2) 19

   (3) 24

   (4) 26



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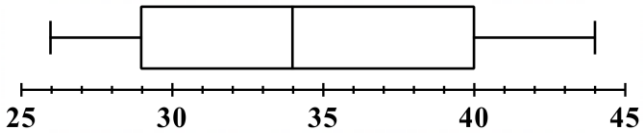
2. The distribution of a data set is shown on the box plot below. Which of the following is the interquartile range of the data set?

   (1) 5

   (2) 8

   (3) 11

   (4) 15



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3. Which of the following is the interquartile range of the data set shown below?

   (1) 20

   (2) 24

   (3) 28

   (4) 32

24, 28, 32, 38, 46, 50, 58, 60

_____

4. The interquartile range shows the spread of which part of the data set?

   (1) the entire data set

   (2) the lower half of the data set

   (3) the middle half of the data set

   (4) the upper half of the data set

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5. Which of the following tends to be true regarding the MAD versus the IQR?

   (1) the MAD is slightly more than half of the IQR

   (2) the IQR is slightly more than half of the MAD

   (3) the MAD is slightly less than half the IQR

   (4) the IQR is slightly less than half of the MAD

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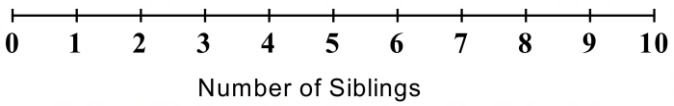
USING YOUR MATH

6. Brielle is trying to answer the question: "How many siblings do my classmates have?". She asks 15 of her classmates to answer the question and finds the following data set.

0, 1, 1, 1, 2, 2, 2, 2, 2, 3, 3, 4, 7, 7, 8

(a) Find the five-number summary below and then draw a box plot for the data set.



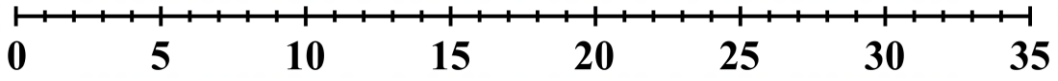
(b) What is the interquartile range for this data set?

(c) Calculate the mean absolute deviation for this data set. Round your answer to the nearest tenth.

7. A class of 20 students was asked to keep track of how many hours of television or other screen time they had in a week. The data is shown below.

0, 9, 9, 10, 10, 10, 11, 11, 11, 13, 15, 15, 17, 19, 20, 20, 21, 22, 22, 34

(a) Create a box plot of the data below. Draw it above the number line.



(b) This data has two **outliers**, one on the lower end and one on the upper end. Eliminate them and then draw a new box plot below the number line.