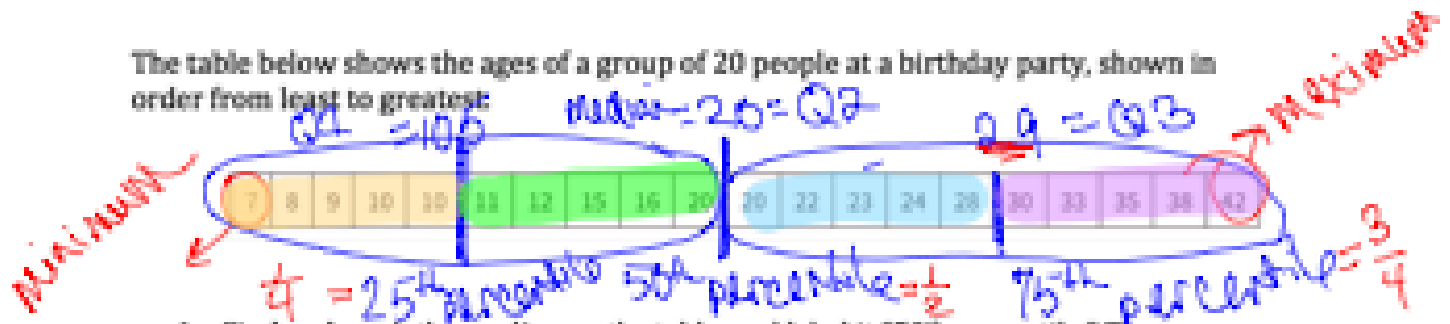Name_____Date_____

ALL ABOUT QUARTILES

The table below shows the ages of a group of 20 people at a birthday party, shown in order from least to greatest.

(handwritten annotations: Q1 = 10, median = 20 = Q2, 29 = Q3, minimum, maximum; data row:) 7 | 8 | 9 | 10 | 10 | 11 | 12 | 15 | 16 | 20 | 20 | 22 | 23 | 24 | 28 | 30 | 33 | 35 | 38 | 42

(handwritten: $Q1 = 25^{th}$ percentile; 50th percentile $= \frac{1}{2}$; 75th percentile $= \frac{3}{4}$)

1. Find and mark the median on the table, and label it "50ᵗʰ percentile." The data is now partitioned into an upper half and a lower half.

2. Find and mark the middle value of the lower half of the data, excluding the median. If there is an even number of values, find and write the down the average of the middle two. Label this value "25ᵗʰ percentile."

3. Find and mark the middle value of the upper half of the data, excluding the median. If there is an even number of values, find and write down the average of the middle two. Label the value "75ᵗʰ percentile."

4. You have now partitioned the data set into four pieces. Each of the three values that "cut" the data is called a quartile.

   o The first (or lower) quartile is the 25ᵗʰ percentile mark. Write "Q1" next to the "25ᵗʰ percentile."

   o The second percentile is the median. Write "Q2" next to that label.

   o The third (or upper) quartile is the 75ᵗʰ percentile mark. Write "Q3" next to that label.

5. Label the least value in the set "minimum" and the greatest value "maximum."

6. Record the five values your have just identified. They are the five-number summary of the data.

   Minimum: __7__ Q1: __10.5__ Q2: __20__ Q3: __29__ Maximum: __42__

7. The median (or Q2) value of this data is 20. What does this tell us about the data?

   Half of the people at the party are 20 yrs or younger while the half were 20 yrs and older.

8. What does each of the following values tell us about the ages of the people at the party?

   a. Q3 *Three quarters of the people at the party are 29 yrs or younger while one quarter are 29 yrs and older.*

   b. Minimum *The youngest person at the party was 7 yrs. old.*

   c. Maximum *The oldest person at the party was 42 yrs. old.*

Extend Your Thinking….

Here is the five-number summary of the age distributions at another birthday party with 21 people in attendance.

Minimum: 5 years   Q1: 6 years   Q2: 27 years   Q3: 32 years   Maximum: 60 years

1. Do you think this party has more or fewer children than the first party?

2. Are there more children or adults at this party? Explain your reasoning.