1. Suppose that distance you can travel on a single battery charge in a certain kind of electric car is normally distributed with mean $60km$ and standard deviation $5km$.

   (a) (10 Points) Sketch the distribution for this variable. Make sure to locate the position of the mean, and also the values that are one, two, and three standard deviations away from this mean. Also sketch the area that covers the lowest 84% of all values.

   (b) (5 Points) Approximately what percentage of all battery charges will last for more than $68km$?

   (c) (5 Points) Identify the 40th percentile for this distribution and interpret it.
2. The following is a list of the scores that a group of 7th grade boys got on a standardized IQ test. \( n = 30, \bar{x} = 113.3, s = 7.0 \).

\[
\begin{array}{cccccccccccc}
77 & 79 & 97 & 97 & 100 & 102 & 103 & 104 & 105 & 105 \\
106 & 107 & 107 & 107 & 110 & 110 & 111 & 111 & 112 & 113 \\
114 & 115 & 115 & 119 & 119 & 120 & 124 & 124 & 126 & 136 \\
\end{array}
\]

(a) (10 Points) Construct a stem-and-leaf plot of this data.

(b) (10 Points) Compute the 5-number summary for this data.

(c) (10 Points) Construct a box plot for this data

(d) (5 Points) Does the data set have any outliers according to the \( 1.5 \times IQR \) rule?
(e) (5 Points) Use your results in a-d to provide a qualitative analysis the distribution of IQ scores.

3. (10 Points) A campus survey collects the following information:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description of variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-Phone</td>
<td>Whether or not the student has an i-phone</td>
</tr>
<tr>
<td>Car</td>
<td>The mean number of miles the student drives each day</td>
</tr>
<tr>
<td>Clubs</td>
<td>How many campus clubs the student is involved in</td>
</tr>
<tr>
<td>Computer</td>
<td>What kind of operating system the student has (Windows or Mac)</td>
</tr>
<tr>
<td>Fitness</td>
<td>How many hours the student exercises each day</td>
</tr>
<tr>
<td>Income</td>
<td>Whether or not the student has an on-campus job.</td>
</tr>
</tbody>
</table>

Based on the descriptions, classify each variable as categorical or quantitative. Provide short justifications for your answers.

4. (5 Points) Consider a simple data set consisting of three points. The figure at right shows these points arranged along a number line. Draw an arrow label “A” at the position of the median, and an arrow labeled “B” at the position of the mean. Also shade the interquartile range. Can you estimate the length of $s$ for this data set?
5. There are two driving tests. One measures knowledge of the rules of the road, and scores are normally distributed with mean 75 and standard deviation 8. The other measures reaction time, and scores are normally distributed with mean 120 and standard deviation 12.

(a) (10 Points) Bob takes both tests, and gets a 79 on the first and a 130 on the second. On which test did he do better?

(b) (10 Points) Suppose Bob is determined to re-take the first test and score better than 99% of the rest of the test-takers. How high must Bob score?

6. (5 Points) A data set contains the GPA for a bunch of 7th graders. At right is a normal quantile plot for this data set. Do you think the data set is normally distributed? Justify your answer.