Lisa has been looking to move into a furnished two-bedroom apartment in La Mesa. After selecting a random sample of 10 apartment units, she came up with a list of what two-bedroom apartments are renting for.

$1300, $1290, $930, $1500, $1000, $2599, $950, $500, $1200, $1290

1) Find the **5-number summary** of two-bedroom rentals in La Mesa.

\[
\begin{align*}
\text{Min} &= 500 \\
Q_1 &= 950 \\
Q_2 &= 1245 \\
Q_3 &= 1300 \\
\text{Max} &= 2599
\end{align*}
\]

**Example for Score**

\[
\frac{25}{30} \times 200 = 167
\]

(Round answers according to the rules talked about during lecture)

If **Summary** is wrong can still get IQR correct

If wrong IQR can still get #3 correct based on #2's IQR

2) Calculate the IQR of two-bedroom rentals in La Mesa.

\[
\text{IQR} = Q_3 - Q_1 = 350
\]

3) Using the **1.5 * IQR rule**, are there any outliers? What are they? **This is not just your opinion; you need to back up your answer with work.**

\[
\begin{align*}
Q_1 - 1.5 \text{ IQR} &= 950 - 1.5(350) = 425 \\
Q_3 + 1.5 \text{ IQR} &= 1300 + 1.5(350) = 1825
\end{align*}
\]

**Outliers here** 425 1825 **Outliers here**

\[
\text{$2599$ is an outlier because it's greater than $1825$}
\]

4) **True/False** Circle your choice.

a) The Empirical Rule can be applied to data with ANY distribution. **True**

b) The **age** of students in this class is discrete data. **True**

c) It doesn't matter how a sample is collected as long as you have a very large sample. **True**

d) Asking people to call in to voice their opinion about an issue is NOT a valid way of collecting a random sample which is representative of the population. **True**

e) A **parameter** is a measurement that comes from the population. **True**

f) A **statistic** is a measurement that comes from a sample. **True**
5) The mean length of one-year-old spotted flounder, in millimeters, is 126 with standard deviation of 18. The mean length of two-year-old spotted flounder is 162 with a standard deviation of 28. The distribution of flounder lengths is approximately bell-shaped. Mark caught a one-year-old flounder that was 190 millimeters in length and a two-year-old flounder that was 200 millimeters in length.

\[ \bar{X} = 126 \quad Z = \frac{X - \bar{X}}{S} \quad Z = \frac{(190 - 126)}{18} = 3.5555 \]

Round to two places \( Z = 3.56 \)

\[ X = 190 \]

b) Find the z-score for the two-year-old flounder that was 200 millimeters in length.

\[ \bar{X} = 162 \quad Z = \frac{X - \bar{X}}{S} \quad Z = \frac{(200 - 162)}{28} = 1.357142857 \]

Round to two Places \( Z = 1.36 \)

\[ X = 200 \]

c) Which fish is longer, relative to fish the same age? Circle your choice.

\( \text{one-year-old flounder} \quad \text{two-year-old flounder} \)

\( Z = 3.56 \) is greater than \( Z = 1.36 \)

d) Is either fish an unusual length? You must explain why. Use z-scores

\[ \begin{array}{c}
\text{usual} \\
\text{usual here} \\
\text{unusual here} \\
\end{array} \]

\( \text{one-year-old} \quad Z = 3.56 \)

is greater than \( Z = 2 \)

So unusual

6) Using the empirical rule, approximate the percentage of one-year-old flounders that are between 108 millimeters and 144 millimeters in length. Assume the distribution of flounder lengths is approximately bell-shaped. The mean length of one-year-old spotted flounder, in millimeters, is 126 with standard deviation of 18.

\[ \bar{X} = 126 \quad S = 18 \]

\[ \begin{array}{c}
\bar{X} + 1S = 144 \\
\bar{X} - 1S = 108 \\
\bar{X} + 2S = 162 \\
\bar{X} - 2S = 90 \\
\bar{X} + 3S = 180 \\
\bar{X} - 3S = 72 \\
\end{array} \]

108 and 144 are one standard deviation away from mean

So Empirical Rule says 68% of data is found within 1 SD.
7) This histogram displays hours of sleep per day for a random sample of 200 subjects.

\[ \overline{X} = \frac{\sum f \cdot x}{\sum f} = \frac{1580}{200} = 7.9 \]

- a) Find the mean hours of sleep.
- b) What percentage of people had less than 9 hours of sleep?

\[ \frac{184}{200} \approx 0.92 \]

Class midpoints \( (x) \)

8) Below are two box plots for the number of cell phone contacts stored on phones owned by men and women.

- a) What percentage of males have between 50 and 100 contacts on their cell phone?
  \[ \approx 50\% \]
- b) What percentage of females have less than 75 contacts on their cell phone?
  \[ \approx 25\% \]
- c) For males is having 350 contacts an outlier?
  Explain.
  \[ Q_3 + 1.5 \times IQR \]
  \[ = 100 + 1.5 (Q_3 - Q_1) \]
  \[ = 100 + 1.5 (100 - 50) \]
  \[ = 175 \approx 175 \]

Since \( 350 > 175 \)
So that's an outlier

Since 350 > 175
So that's an outlier

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The given frequency distribution lists the one-way commuting distances of workers in San Diego for the month of January.

10) Complete the table by finding the class midpoints.  

<table>
<thead>
<tr>
<th>Distances in miles</th>
<th>Frequency</th>
<th>Class Midpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 8</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>9 - 16</td>
<td>8</td>
<td>12.5</td>
</tr>
<tr>
<td>17 - 24</td>
<td>20</td>
<td>20.5</td>
</tr>
<tr>
<td>25 - 32</td>
<td>12</td>
<td>28.5</td>
</tr>
<tr>
<td>33 - 40</td>
<td>8</td>
<td>36.5</td>
</tr>
<tr>
<td>41 - 48</td>
<td>1</td>
<td>44.5</td>
</tr>
</tbody>
</table>

11) Find \( \sum f \) (give the numerical answer) \( n = 51 \)  

12) What is the class width? \( 8 \)

13) Find the mean number of miles driven in the month of January. 

\[ \overline{x} = 23.48039216 \quad \text{Round} \quad \overline{x} = 23.5 \]

14) Find the standard deviation for the number of miles driven in the month of January. 

\[ S = 8.902786521 \quad \text{Round} \quad S = 8.9 \]

15) Find the variance for the number of miles driven in the month of January. 

\[ S^2 = (8.902786521)^2 = 79.25460784 \]

\( S^2 = 79.3 \)
16) The mean of electrical energy consumption amounts for a home during a two-month period is 2767 kWh, and the standard deviation is 472 kWh.

\[
\bar{x} = \frac{2767}{7} \quad S = 472
\]

a) find the minimum "usual" value

\[
\bar{x} - 2S = 2767 - 2(472) = 1823
\]

b) find the maximum "usual" value

\[
\bar{x} + 2S = 2767 + 2(472) = 3711
\]

c) For one particular two-month period, the power company recorded consumption of 3700 kWh. Is that amount unusual? Explain.

3700 kWh is not unusual (usual)

It is between the min: max usual values