1. (20 pts) Approximate the mean and standard deviation of the data set.

Sample annual salaries (in thousand of dollars) for private elementary school teachers:

<table>
<thead>
<tr>
<th>Salary</th>
<th>Frequency</th>
<th>$x - \bar{x}$</th>
<th>$(x - \bar{x})^2$</th>
<th>$f(x - \bar{x})^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>10</td>
<td>-14.9</td>
<td>222.01</td>
<td>2220.1</td>
</tr>
<tr>
<td>26-30</td>
<td>15</td>
<td>-9.9</td>
<td>98.01</td>
<td>1470.15</td>
</tr>
<tr>
<td>31-35</td>
<td>12</td>
<td>-4.9</td>
<td>24.01</td>
<td>288.12</td>
</tr>
<tr>
<td>36-40</td>
<td>18</td>
<td>0.1</td>
<td>0.01</td>
<td>0.18</td>
</tr>
<tr>
<td>41-45</td>
<td>20</td>
<td>5.1</td>
<td>26.01</td>
<td>520.2</td>
</tr>
<tr>
<td>46-50</td>
<td>25</td>
<td>10.1</td>
<td>102.01</td>
<td>2550.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>0.0</strong></td>
<td><strong>2500.25</strong></td>
<td><strong>7049</strong></td>
</tr>
</tbody>
</table>

$$\bar{x} = \frac{23 \cdot 10 + 28 \cdot 15 + 33 \cdot 12 + 36 \cdot 18 + 43 \cdot 20 + 48.25}{100} = 37.9$$

$$\sigma = \sqrt{\frac{7049}{99}} \approx 8.4$$

Mean $37.9$

Standard deviation $8.4$

2. (15 pts) For the month of May, a checking account has a balance of $759 for 24 days, $2,415 for 2 days, and $250 for 5 days. What is the account’s mean daily balance for May?

$$\bar{x} = \frac{\sum (x \cdot w)}{\sum w} = \frac{759 \cdot 24 + 2,415 \cdot 2 + 250 \cdot 5}{31} = \frac{24296}{31} = \$783.74$$

Answer $\$783.74$ or $\$783.7$
3. (18 pts) Lengths of pregnancies of humans are normally distributed with a mean of 265 days and a standard deviation of 10 days.
   a) (8 pts) Use the Empirical Rule to determine the percentage of women whose pregnancies are between 265 and 285 days.
   
   \[
   34\% + 13.5\% = 47.5\% \]

   Answer: _________

   b) (10 pts) In a sample of 300 pregnancies, about how many of those are more than 255 days?
   
   \[
   50\% + 34\% = 84\% \\
   0.84 \times 300 = 252
   \]

   Answer: 252 pregnancies

4. (11 pts) Display the data using a Pareto Chart.

   U.S. sporting goods sales (in billions of dollars) can be classified in four areas:

<table>
<thead>
<tr>
<th>Areas</th>
<th>$ (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footwear</td>
<td>15.7</td>
</tr>
<tr>
<td>Equipment</td>
<td>24.0</td>
</tr>
<tr>
<td>Clothing</td>
<td>11.7</td>
</tr>
<tr>
<td>Recreational-transport</td>
<td>38.5</td>
</tr>
</tbody>
</table>
5. (9 pts) Determine whether the data are qualitative or quantitative:

a) the colors of automobiles on a used car lot  \( \text{qualitative} \)
b) the numbers on the shirts of a girl’s soccer team  \( \text{quantitative} \)
c) the number of seats in a movie theater  \( \text{quantitative} \)

6. (12 pts) Identify the data set’s level of measurement (nominal, ordinal, interval, ratio):

a) numbers on the shirts of a girl’s soccer team  \( \text{nominal} \)
b) ages of students in a statistics class  \( \text{ratio} \)
c) temperatures of 22 selected freezers  \( \text{interval} \)
d) number of milligrams of tar in 28 cigarettes  \( \text{ratio} \)

7. (15 pts) The mean sale per customer for 90 customers at a gas station is 38$, with a standard deviation of $6. On the basis of Chebychev’s Theorem, at least how many of the customers spent between $14 and $62?

\[ \bar{x} = 38 \]
\[ s = 6 \]

\[ K = 4 \]

\[ 1 - \frac{1}{K^2} = 1 - \frac{1}{4^2} = 1 - \frac{1}{16} = 0.9375 \]

\[ 93.75\% \]

\[ 0.9375 \times 90 = 84.375 \approx 84 \]

[at least 84 customers]