Note 1: Whether the air density is greater or less than 1.2 kg/m³ the buoyancy correction can be positive or negative.

**Pipet:**

25 mL Pipet:

Based on the average of measured temperature:

Trial 1: mass of water \( \times \) conversion factor = true volume = T1
Trial 2: mass of water \( \times \) conversion factor = true volume = T2
Trial 3: mass of water \( \times \) conversion factor = true volume = T3

Average true volumes (mL): \( \bar{T} \)

\[
SD = \sqrt{\frac{[(\bar{T} - T_1)^2 + (\bar{T} - T_2)^2 + (\bar{T} - T_3)^2]}{3-1}}
\]

Relative Standard Deviation (ppt) = \( \frac{SD}{\bar{T}} \times 1000 \)

95% Confidence Interval = \( \bar{T} \pm [t \times (SD)]/\sqrt{3} \)

Example I:

Average = 25.0021
95% C.I.: ± 0.0342 mL (uncertainty is in the hundredths place)

Regarding to uncertainty (1 sig. fig.), the uncertainty in delivery is in the second decimal place (we should round the answer) as:

Average ± (95% C.I.)
25.00 ± 0.03 mL uncertainty has 1 sig. fig., places must match (...be hundredths)

Example II:

Average = 24.9914 mL
95% C.I.: ± 0.00421 mL (uncertainty is in the thousandths place)

Average ± (95% C.I.)
24.991 ± 0.004 mL uncertainty has 1 sig. fig., places must match (...be thousandths)

Note 2: Use table to find \( t \) for (n-1), page 58 textbook, T 4-2

Note 3: if \( \frac{[t \times (SD)]}{\sqrt{3}} \leq 0.02 \) is acceptable

Note 4: Add one sample Calc. for one trial to your lab report.
Sample **Buret spreadsheet:**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Average nominal Volume (mL)</td>
<td>Average ΔV (correction factor)</td>
<td></td>
<td>Type Your data as shown here.</td>
</tr>
<tr>
<td>2</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9.98</td>
<td>0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>19.95</td>
<td>-0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>30.20</td>
<td>-0.045</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>40.35</td>
<td>-0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>49.85</td>
<td>0.030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose a cell outside of your table area and click on the **Chart Wizard**

**For Chart Type:** choose XY scatter
**For Chart sub-type:** choose the data points connected by lines
Go to the NEXT
**Choose:** Series
*Choose Add*
*For the X Values:* click on its arrow in the box
*Use the mouse & SHIFT key to select values in column A*
*Close the Chart Source data for X values*
*Do same steps for the Y-values and choose the values in column B*
**NEXT**
**Title:** add titles for the chart, X-axis, and Y-axis
**Gridlines:** Choose Minor for X-axis, Major for Y axis (optional)
**Legend:** Remove it

*Note:* Right-click the X-axis, and choose the Format Axis...command. On the Patterns tab choose the Low Tick mark labels radio button.
**FINISH**

You can change the **font** of the text by clicking on the text. You can highlight the chart (clicking) to choose it for the print.

**To move the X-axis:** Double click the Y axis to get the Format dialog and then change the Category (X) axis crosses at: value. In this example you can see I have used a value (-0.1), much less than the actual data in the chart.

![Sample Buret Chart](image)