Post-lab 1.

1. RTD Resistance at 25°C: $\boxed{109.9\ ^{\circ}C}$

2. For 26 ga. wire is 133.9 mΩ/m. 75m

$\Rightarrow$ Added R per lead = 133.9 mΩ/m × 75m = $\boxed{10.0425\ \Omega}$

3. Total lead resistance. $= 2 \times 10.0425\ \Omega = 20.085\ \Omega$

$109.92\ \Omega + 20.085\ \Omega = \boxed{130.005\ \Omega.}$

4. Convert to Temperature: For 30°C. $R = 113.92\ \Omega$

$$T = 25 + \frac{130.005 - 109.92}{113.92 - 109.92} \times (30 - 25) = \boxed{50.11\ ^{\circ}C}$$

5: Significant error example: engine monitoring, incorrect temp read

6. Insignificant error example: In a home HVAC systems. Small erros in temperature readings won't have a noticeable effect.

7. Meet requirement: total lead $R = 2 \times (3.28 \times 75) = \boxed{0.492\ \Omega < 1\ \Omega}$

8 The cost of 10ga wire is $4.246 per foot.

$$75m \times 3.28084 \frac{ft}{m} = 246.0628 ft.$$

$$\text{total cost} = 246.0628 ft \times 4.246 \frac{\$}{ft} = \boxed{1044.78\$}$$

9. Recommendation: Use 4-wire measurement. It cancels lead resistance errors and is more cost-effective and accurate for long distance compared to using large-gauge wires.