TODO

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1 Section 1

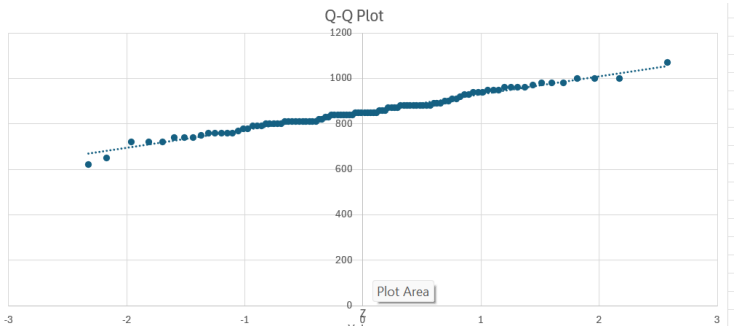

Figure 1: QQ Plot

2 Section 2

The QQ plot above looks relatively linear and the points are close to the line. This suggests that the data is normally distributed. However, the tails of the QQ plot are not perfectly linear, which suggests that the data may not be perfectly normally distributed. Therefore, it is plausible to conclude that the 100 times recorded follow a normal distribution approximately.

3 Section 3

The 90% confidence interval for the standard deviation of the time measurement for the device being evaluated in the dataset is $(70.82, 89.56)$. This was calculated using the formula:

$$\left(\sqrt{\frac{(n-1)s^2}{\chi^2_{\alpha/2,n-1}}}, \sqrt{\frac{(n-1)s^2}{\chi^2_{1-\alpha/2,n-1}}}\right)$$

where $n = 100$, $s = 79.01$, and $\alpha = 0.1$.

4 Section 4

The null hypothesis is $H_0 : \sigma = 80$ nanoseconds and the alternative hypothesis is $H_A : \sigma \neq 80$ nanoseconds. The level of significance is $\alpha = 0.1$. The test statistic is calculated as:

$$\frac{(n-1)s^2}{\sigma^2} = \frac{99 \cdot 79.01^2}{80^2} = 96.57$$

The critical values for the test statistic are $\chi^2_{0.05,99} = 123.22$ and $\chi^2_{0.95,99} = 77.05$. Since the test statistic is in between the critical values, we fail to reject the null hypothesis. Therefore, Mr. Atoz would approve the device for sale.