Inference Worksheet

Step 1: State the Hypotheses

Null Hypothesis (H$_0$): μ = 3 (children watch 3 hours of TV daily)

Alternative Hypothesis (H$_1$): μ ≠ 3 (children watch a different amount)

This is a two-tailed test.

Step 2: Set the Criteria for a Decision

Significance Level (α) = 0.05

Critical Z-value for two-tailed test at 0.05 = ±1.96
(Using standard normal distribution)

Step 3: Compute the Test Statistic

We use the Z-test formula (population standard deviation is known):

$$Z = \frac{\bar{X} - \mu}{\sigma/\sqrt{n}} = \frac{4 - 3}{1.5/\sqrt{36}} = \frac{1}{0.25} = 4.0$$

Step 4: Make a Decision

Calculated Z = 4.0

Critical Z = ±1.96

Since 4.0 > 1.96, we are in the rejection region.
p-value is much less than 0.05 → significant

Final Conclusion:

Since the Z-value (4.0) lies beyond the critical region and the p-value < 0.05, we reject the null hypothesis.

Conclusion: There is strong evidence that children watch more or less than 3 hours of TV daily (in this case, more).