

Name: _____

1. [4 marks] The scores on a national exam were normally distributed with a mean of 71 and a population standard deviation of 12 . If a random sample of 40 scores is taken, what is the probability that the mean of the scores is less than 68?

2. [3 marks] You wish to estimate the population proportion p correct to within 0.005 with probability 90%. You do not have any estimates for p . What is the smallest sample size you should take?

3. [2 marks] You are presented a 95% confidence interval for μ . Explain what the phrase **95% confidence** means in this context.

4. [6 marks] Data from a tire factory's two assembly lines:

Assembly Line	Sample Size	Number of Defective Tires
1	1000	22
2	1200	33

Perform a hypothesis test at the 5% significance level to test whether Assembly Line 2 has a higher proportion of defective tires.

5. [6 marks] Weights (in grams) for six Red Delicious apples:

136 180 197 142 165 171

a) You want to test the hypothesis $\mu = 150$ at the 5% significance level. What assumption do you need?

b) Perform the hypothesis test in part a).

c) What can you say about the p -value?

6. [4 marks] Consider $H_0: \mu = 82$ versus $H_a: \mu \neq 82$ tested at the 95% confidence level with a random sample of size 60. The population standard deviation is $\sigma = 8$. If the true population mean is $\mu = 76$, what is the probability of not rejecting H_0 ?