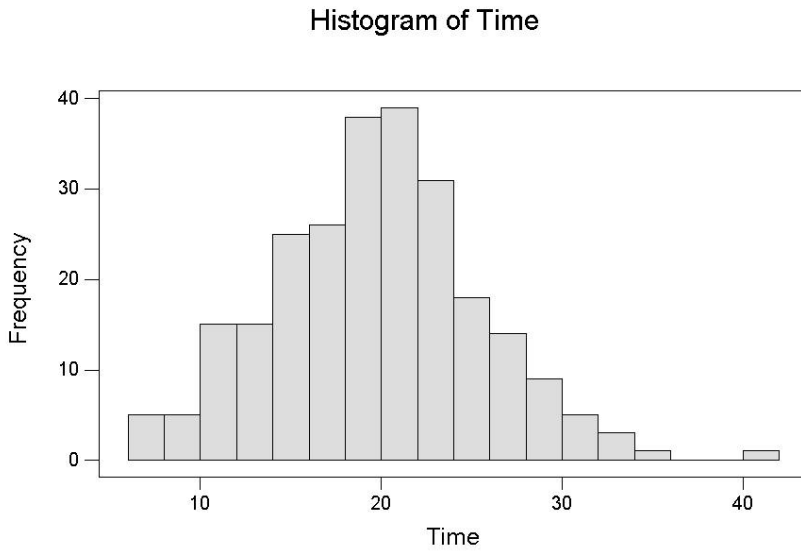


Problem 2 (30 pts) A survey of 250 Japanese middle managers was taken to discover how much time (in hours) they spent in leisure activities per week. Results from Minitab are below:



Descriptive Statistics: Time

Variable	N	Mean	Median	TrMean	StDev	SE Mean
Time	250	19.280	19.000	19.201	5.776	0.365

Variable	Minimum	Maximum	Q1	Q3
Time	6.000	40.000	15.000	23.000

1. (10 pts) Assuming that the population standard deviation is 6 hours, estimate with 90% confidence the mean leisure time per week for all Japanese middle managers.

2. (5 pts) Interpret your results.

3. (10 pts) Still assuming that the standard deviation is 6 hours, determine the sample size necessary to estimate the mean leisure time to within one hour.

4. (5 pts) How could you (or did you!) use the histogram in your analysis?

Problem 3 (15 pts) A summer camp director claims that 50% of his charges indicate on their camp evaluations that they had a great time at camp.

1. (9 pts) Assuming that this claim is true, what is the probability that in a random sample of 500 campers, fewer than 45% say they've had a great time?

2. (6 pts) Suppose that in a random sample of 500 campers, 225 indicate that they had a great time? What does this tell you about the director's claim?

Problem 4 (15 pts) A school near a nerve-gas disposal facility has been mandated to regularly monitor the air in the school. As a parent preparing to enroll your child, you are concerned that the air may not be safe for your child's health.

1. (6 pts) If you were to conduct a test, how would you set up the null and alternative hypotheses? Explain.
2. (6 pts) Describe type I and type II errors given your hypotheses. What are the consequences of making these errors?
3. (3 pts) Discuss the relative values you would want α and β to have considering the consequences of the errors.

Problem 6 (10 pts) For the following five terms, provide a short definition.

1. p -value
2. null and alternative hypotheses

3. unbiased estimator

4. interval estimator

5. consistent estimator

Problem 5 (15 pts) A random sample of 12 students in a business statistics course was drawn. At the course's completion each student was asked how many hours s/he spent doing homework in statistics. The data are given as follows:

31, 40, 26, 30, 36, 38, 29, 40, 38, 30, 35, 38

It is known (who knows how!) that the population standard deviation is $\sigma = 8$. The instructor had recommended that the students devote 3 hours per week for the 12-week course.

1. (10 pts) Test to determine whether there is evidence that the average student spent less than the recommended amount of time at a 5% significance level. In particular, compute the p -value of the test.

2. (5 pts) Comment on the validity of the test procedure.