

Statistics – Math 1530 Ch. 5,6 Practice Test

Name:

Please only write your name on this sheet. All work and answers should be attached on notebook paper.

1. If z follows the **standard normal distribution** (so $\mu = 0$, and $\sigma = 1$), shade the appropriate area and find the following:
 - a) The probability that z is between zero and 2.13
 - b) The probability that z is less than - 1.65
 - c) The probability that z is between - 1.09 and 1.32
 - d) The probability that z is greater than - 1.58
 - e) The probability that z is between - 2.03 and zero
 - f) The probability that z is greater than 15.65
 - g) Find the value of z that separates the top 40% of the distribution from the bottom 60%.
 - h) Find Q_3 , the 3rd quartile of the z distribution.

2. If x follows a normal distribution with a mean of 90 and a standard deviation of 12, find the following:
 - a) The probability that x is between 90 and 98.
 - b) The probability that x is less than 95.
 - c) The probability that x is between 85 and 96.
 - d) The 25th percentile of the distribution.

3. The lifespans of a species of fruit fly are normally distributed, with a mean of 36 days and a standard deviation of 4 days.
 - a) Find the probability that a random selected fruit fly lives more than 30 days.
 - b) Find the cutoff score that separates the 15% of the flies that live the shortest lives from the 85% of the flies that live the longest lives.

4. The population mean annual salary for plumbers is \$32,500. A random sample of 42 plumbers is drawn from this population. What is the probability that the mean salary of the sample is less than \$30,000? Assume the standard deviation is \$5600.

5. During a certain week the mean price of gasoline in Knoxville was \$1.599 per gallon, with a standard deviation of \$0.095.
 - a) Find the probability that a randomly selected gas station charges more than \$1.499 per gallon.
 - b) Find the probability that the average price of gas for 35 randomly selected gas stations is more than \$1.499 per gallon.

6. Is it more unusual for a term to be 1.5 standard deviations below the mean than a term to be 2 standard deviations above the mean? Why or why not?
7. A survey of 1,000 adults were asked if they would give personal data to a company for credit purposes. There were 290 respondents who said they would never give personal data to a company.
 - a) Find the sample proportion of people who would never give personal data to a company.
 - b) Construct a 90% confidence interval estimate of the proportion of all people who would never give personal data to a company.
 - c) Find the sample size necessary to estimate the proportion of people who would never give personal data to a company, if you want a 95% confidence interval and a 0.02 margin of error. (Use your answer from part a as a prior estimate of the true proportion.)
8. Using the Wechsler Adult Intelligence Scale, 36 people who were 25 years old were tested. The mean score of this sample was 45.3 and the standard deviation of the sample was 12.7 points. Construct a 95% confidence interval for the mean score of the population of all 25 year old people.
9. A search of the literature indicates that the heights of American beech trees have a standard deviation of 2.130 meters. Construct a 99% confidence interval for the mean height of this population of trees, given that a random sample of 56 trees has a mean height of 10.452 meters.
10. You wish to estimate with 99% confidence, the proportion of computers that need repairs or have problems by the time the product is five years old. Your estimate must be accurate within 3.5% of the true proportion. Assume no prior estimate of p is available. What is the sample size needed?
11. If the mean of a sample of 10 measurements is 25.7 and the sample standard deviation is 3.2, find the 90% confidence interval for the population mean.
12. You want to estimate the percentage of republicans among college students. How many students must you survey in order to be 99% confident that your sample proportion is within 5% of the true population percentage? No prior estimate of this percentage is available.