

1. Find the critical value  $z_c$  that corresponds to a 94% confidence level.  
**1.88**
2. Determine the error of estimate if the grade point averages for 10 randomly selected students from a class of 125 students has a mean of  $\bar{x} = 3.2$ . Assume the grade point average of the 125 students has a mean of  $\mu = 3.8$ .  
**0.6**
3. A random sample of 150 students has a grade point average with a standard deviation of 0.78. Find the maximum error of estimate if  $c = 0.98$ .  
**0.15**
4. A random sample of 40 students has a test score with  $\bar{x} = 81.5$  and  $s = 10.2$ . Construct the confidence interval for the population mean,  $\mu$  if  $c = 0.90$ .  
**(78.8, 84.1)**
5. In a recent study of 42 eighth graders, the mean number of hours per week that they watched television was 19.6 with a standard deviation of 5.8 hours.
  - a) Find the 98% confidence interval of the mean. **(17.5, 21.7)**
  - b) If the standard deviation is doubled to 11.6, what will be the effect on the confidence interval?  
**An increase in the standard deviation will widen the confidence interval.**
6. The standard IQ test has a mean of 100 and a standard deviation of 15. We want to be 98% certain that we are within 2 IQ points of the true mean. Determine the required sample size.  
**306**
7. A nurse at a local hospital is interested in estimating the birth weight of infants. How large a sample must she select if she desires to be 95% confident that the true mean is within 3 ounces of the sample mean? The standard deviation of the birth weights is known to be 7 ounces.  
**21**
8. Find the critical value,  $t_c$ , for  $c = 0.90$  and  $n = 15$ .  
**1.761**
9. Find the value of  $E$ , the maximum error of estimate, for  $c = 0.99$  and  $n = 10$  and  $s = 3.5$ .  
**3.60**
10. Construct a 90% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. A sample of 15 randomly selected students has a grade point average of 2.86 with a standard deviation of 0.78.  
**(2.51, 3.21)**
11. Construct a 90% confidence interval for the population mean,  $\mu$ . Assume the population has a normal distribution. In a recent study of 22 eighth graders, the mean number of hours per week that they watched television was 19.6 with a standard deviation of 5.8 hours.  
**(17.47, 21.73)**

12. A manufacturer receives an order for fluorescent light bulbs. The order requires that the bulbs have a mean life span of 500 hours. The manufacturer selects a random sample of 25 fluorescent light bulbs and finds that they have a mean life span of 495 hours with a standard deviation of 15 hours. Test to see if the manufacturer is making acceptable light bulbs. Use a 95% confidence level. Assume the data are normally distributed.

**(488.8, 501.2) Because the interval contains the desired life span of 500 hours, they are making good light bulbs.**

13. When 320 college students were surveyed, 125 said they own their car. Find a point estimate for  $p$ , the population proportion of students who own their cars.  
**0.391**

14. A survey of 2450 golfers showed that 281 of them are left-handed. Find a point estimate for  $p$ , the population proportion of golfers that are left-handed.  
**0.115**

15. When 320 college students were surveyed, 125 said they own their car. Construct a 95% confidence interval for the proportion of college students who say they own their cars.  
**(0.337, 0.444)**

16. A survey of 250 households showed 62 owned at least one gun. Construct a 90% confidence interval for the proportion of households that own at least one gun.  
**(0.203, 0.293)**

17. A researcher at a major hospital wishes to estimate the proportion of the adult population of the United States that has high blood pressure. How large a sample is needed in order to be 99% confident that the sample proportion will not differ from the true proportion by more than 3%? **1842**

18. A manufacturer of golf equipment wishes to estimate the number of left-handed golfers. How large a sample is needed in order to be 98% confident that the sample proportion will not differ from the true proportion by more than 5%? A previous study indicates that the proportion of left-handed golfers is 10%.  
**196**

19. A lawn mower manufacturer is trying to determine the standard deviation of the mean life of one of its lawn mower models. To do this, it randomly selects 12 lawn mowers that sold several years ago and finds that the sample standard deviation is 3.25 years (assume it was normally distributed). Construct a 99% confidence interval for the population standard deviation,  $\sigma$ .

**(2.08, 6.68)**

20. You randomly select and weigh 30 samples of an allergy medicine. The sample standard deviation is 1.2 mg. Assuming the weights are distributed, construct a 90% confidence interval for the population standard deviation,  $\sigma$ .

**(0.99, 1.53)**