

Page 308.  $E$  is the maximum allowed amount of error.

8.56 You wish to estimate a population mean based on a random sample of  $n$  observations. Prior experience suggests that  $\sigma = 12.7$ . If you wish to estimate  $\mu$  correct to within 1.6 with probability equal to .95, how many observations should be included in your sample?

$E =$

$SE =$

Equation:

$$n = \underline{\quad} \underline{\quad} \underline{\quad} \quad 9$$

8.58 Independent random samples of  $n_1 = n_2 = n$  observations are to be selected from each of two populations 1 and 2. You wish to estimate the difference between the two population means correct to within .17 with probability equal to .9. How large should  $n$  be. Assume that you know that  $\sigma^2_1 = \sigma^2_2 = 27.8$

$E =$

$SE =$

Equation:

$$n = \underline{\quad} \underline{\quad} \underline{\quad} \underline{\quad} \quad 14$$

8.62 Republicans and Democrats are surveyed with a "yes/no" questionnaire. The experimenter requires that the sampling error for the difference in the proportions of the yes responses for the two groups be no more than  $\pm 3$  percentage points. If the two samples are the same size  $n$ , how large must  $n$  be?

$E =$

$SE =$

Equation:

$$n = \underline{\quad} \underline{\quad} \underline{\quad} \underline{\quad} \quad 11$$

8.64 A researcher measures the annual consumption of beef in pounds per year for 400 subjects. The first study was conducted 10 years ago. Now he repeats the study with the same group of 400 people.

	10 years ago	now
sample mean	73	63
sample std. dev.	25	28

The researcher wishes to show that the per capita beef consumption has decreased in the last 10 years. She needs to show that the difference  $\mu_{-10} - \mu_0$  between the 10-year-ago mean  $\mu_{-10}$  and the current mean  $\mu_0$  is significantly greater than 0.

(a) Find the 99% confidence bound interval for the difference. You have to determine (this takes some careful thought, the wrong direction gives trivial answers) if it is upper or lower.

$$SE = \quad = \underline{\quad} \underline{\quad} \underline{\quad} \quad 17$$

Confidence interval:

$$\mu_{-10} - \mu_0 \in \quad \quad 14$$

(b) Is the decrease significant at the 99% confidence level?

Why?