10.16 Housework for women and men Do women tend to spend more time on housework than men? If so, how much more? Based on data from the National Survey of Families and Households, one study reported the results in the table for the number of hours spent in housework per week. (*Source*: Data from A. Lincoln, *Journal of Marriage and Family*, vol. 70, 2008, pp. 806–814.)

TRY

Housework Hours

Gender	Sample Size	Mean	Standard Deviation
Women	476	33.0	21.9
Men	496	19.9	14.6

a. Based on this study, calculate how many more hours, on the average, women spend on housework than men.

33 -19.9

b. Find the standard error for comparing the means. What factor causes the standard error to be small compared to the sample standard deviations for the two groups?

sqrt(21.9^2/476 + 14.6^2/496)

=1.2 large sample size

c. Calculate the 95% confidence interval comparing the population means for women and men. Interpret the result including the relevance of 0 being within the interval or not.

95% CI 13.1+-1.98*1.2, 0 not in interval, exist mean difference, population mean for women > men

d. State the assumptions upon which the interval in part c is based.

quantitative, random, independent, approx. normal

10.34 Body dissatisfaction Female college student participation in athletics has increased dramatically over the past few decades. Sports medicine providers are aware of some unique health concerns of athletic women, including disordered eating. A study (M. Reinking and L. Alexander, *Journal of Athletic Training*, vol. 40, 2005, p. 47–51) compared disordered-eating symptoms and their causes for collegiate female athletes (in lean and nonlean sports) and nonathletes. The sample mean of the body dissatisfaction assessment score was 13.2 ($s = 8.0$) for 16 lean sport athletes (those sports that place value on leanness, including distance running, swimming, and gymnastics) and 7.3 ($s = 6.0$) for the 68 nonlean sport athletes. Assuming equal population standard deviations,

s = sqrt((15*8^2+67*6^2)/16 + 68 - 2) = 6.413 se = 6.413*sqrt(1//16 + 1/ 68

a. Find the standard error for comparing the means.

b. Construct a 95% confidence interval for the difference between the mean body dissatisfaction for lean sport athletes and nonlean sport athletes. Interpret.

95 % CI 13.2 - 7.3 +- 1.99*1.782

we can be 95% confident that …….

0 is not in the interval for lean sport > for non lean sport

10.23 Some smoked but didn't inhale Refer to Examples 6–8 on nicotine dependence for teenage smokers. Another explanatory variable was whether a subject reported inhaling when smoking. The table reports descriptive statistics.

TRY

	HONC Score		
Group	**Sample Size**	**Mean**	**Standard Deviation**
Inhalers	237	2.9	3.6
Noninhalers	95	0.1	0.5

a. Explain why (i) the overwhelming majority of noninhalers must have had HONC scores of 0 and (ii) on average, those who reported inhaling answered yes to nearly three more questions than those who denied inhaling.

b. Might the HONC scores have been approximately normal for each group? Why or why not?

c. Find the standard error for the estimate $(\bar{x}_1 - \bar{x}_2) = 2.8$. Interpret.

d. The 95% confidence interval for $(\mu_1 - \mu_2)$ is (2.3, 3.3). What can you conclude about the population means for inhalers and noninhalers?

10.24 Inhaling affect HONC? Refer to the previous exercise.

a. Show that the test statistic for H_0: $\mu_1 = \mu_2$ equals $t = 11.7$. If the population means were equal, explain why it would be nearly impossible by random variation to observe this large a test statistic. se = 0.24, t = (29-0.1)/0.24

b. What decision would you make about H_0, at common significance levels? Can you conclude which group had higher mean nicotine dependence? How?

p-value = 2*P, probability of getting a test stat this large is 0.00

c. State the assumptions for the inference in this exercise.

10.48 Test for blood pressure TRY Refer to the previous exercise. The output shows some results of using software to analyze the data with a significance test.

```
Paired T for Before—After

              N     Mean    StDev    SE Mean
Before        3    150.0     15.0      8.660
After         3    130.0     10.0      5.774
Difference    3     20.0      5.0      2.887
T-Test of mean difference = 0 (vs not = 0):
T-Value = 6.93  P-Value = 0.020
```

H0: u1 = u2

a. State the hypotheses to which the reported P-value refers.

b. Explain how to interpret the P-value. Does the exercise program seem beneficial to lowering blood pressure?

p-value small t- value positive, exercie program seem beneficial

c. What are the assumptions on which this analysis is based?

quantitative, random, independent, difference scores are approx. normal, sample is small

10.54 Internet book prices Anna's project for her introductory statistics course was to compare the selling prices of textbooks at two Internet bookstores. She first took a random sample of 10 textbooks used that term in courses at her college, based on the list of texts compiled by the college bookstore. The prices of those textbooks at the two Internet sites were

Site A: \$115, \$79, \$43, \$140, \$99, \$30, \$80, \$99, \$119, \$69

Site B: \$110, \$79, \$40, \$129, \$99, \$30, \$69, \$99, \$109, \$66

a. Are these independent samples or dependent samples? Justify your answer. dependent prices of same books on diff rates

b. Find the mean for each sample. Find the mean of the difference scores. Compare, and interpret.

c. Using software or a calculator, construct a 90% confidence interval comparing the population mean prices of all textbooks used that term at her college. Interpret.