

No.

Chapter 9: Takehome Pop Quiz

- 1 We measured the mean vertical jump height of high school athletes. We found the values below:

	\bar{x}								s	
Dia:	31	29	24	27	33	36	23	19	28	5

- a) Find the 98% confidence interval for the mean jump height, assuming an approximately normal distribution.

- b) Can you reject a claim that the true mean is 2 ? Defend.

- 2 Two different herbicides are used to treat corn fields. We wish to know if one is more effective than the other. Assume equal variances.

$$\text{Herbicide 1: } n = 8 \quad \bar{x} = 11 \quad s^2 = 1.4$$

$$\text{Herbicide 2: } n = 12 \quad \bar{x} = 16 \quad s^2 = 1.0$$

- a) State the 99% confidence interval for the difference in yields:

- b) Defend a conclusion about whether one herbicide is clearly better than the other.

3 We want to determine the true proportion of defective products. How many samples are needed to be at least 98% sure that the estimate is within 2% of the true proportion?

4 Given the data below for a random sample from a normally distributed population,

$$n = 81 \quad \bar{x} = 0.20 \quad \sigma = 0.1$$

a) show the 90% confidence interval for the mean:

b) Discuss whether we should accept the possibility that $\mu = 0.000$

- 5 In a study comparing two bicycles researchers tested subjects' times to finish a specific distance on the bicycle. For each age group they picked two individuals with the same age, previous experience, and fitness score and assigned one to each of the two bicycles at random. The results are below:

	Riders									\bar{x}	s
	1	2	3	4	5	6	7	8	9		
Bicycle 1	38	25	35	41	44	29	37	31	38	35.3	6.02
Bicycle 2	30	25	31	38	40	28	36	30	39	33.0	5.36
diff	8	0	4	3	4	1	1	1	-1	2.33	2.74

- a) State the 95% confidence interval for the difference in times:

- b) Can you conclude that one bicycle is better than the other? Defend your answer.

- 6 A particular brand of cereal is supposed to average 312 gms and have a standard deviation of 10 gm. A consumer group purchased 5 boxes at random and found the following:
(Assume normal distribution)

		\bar{x}	\underline{s}	\underline{s}^2				
Weight	321	303	298	333	303	312	14.8	220

- a) Construct the 95% confidence interval for the variance:

- b) Can you reject the claimed variance with 95% certainty?

7 How large a deviation can be detected with a 99% two-sided confidence for a study with the sample size and variance given below?

8 Given the sampling data below:

	<u>n</u>	<u>\bar{x}</u>	<u>\underline{s}</u>	<u>\underline{s}^2</u>
Brand A	12	11	0.6	0.36
Brand B	8	14	1.2	1.44

a) Construct the 98% confidence interval for the variances:

b) Can you reject the hypothesis that the variances are equal?

- 9 Your boss wants a study to decide whether to switch to a supplier who claims that they can change curing time by 5 minutes. Given the data below, what is the minimum sample size for a 95% two-sided confidence for the mean? Assume normal population.

Given: $\sigma = 15$

b) Can we reject the possibility that 50% are defective?

12 Two different herbicides are used to treat soybean fields. We wish to know if one is more effective than the other. Assume **UNE**qual variances.

Herb 1	$n = 13$	$\bar{x} = 30$	$s = 5$
Herb 2	$n = 8$	$\bar{x} = 23$	$s = 10$

a) State the 95% confidence interval for the difference in yields:

b) Defend a conclusion about whether one herbicide is clearly better than the other.

13 Two independent random samples with statistics below were taken. For that data, determine the 98% confidence interval for the difference in the population means.

Sample A: $n = 16$ $\bar{x} = 50$ $\sigma = 5$

Sample B: $n = 9$ $\bar{x} = 36$ $\sigma = 2$

b) Can we reject a claim that there is no difference between these two proportions?