

- (1) Pete Zaria owns the Papa's Pizza chain. Recently, Pete hired a new chef. A random sample of ten pepperoni pizza's made by Pete's old chef and pepperoni pizza made by his new chef yielded the following number of slices of pepperoni per pizza.
- | New Chef                               | Old Chef                               |
|--|--|
| 32, 36, 39, 28, 25, 26, 28, 32, 34, 35 | 28, 36, 38, 42, 36, 34, 31, 32, 40, 33 |
- Find the sample mean and standard deviation for both types of crust
  - Use a 90% confidence interval to estimate the difference between the average slices of pepperoni per pizza for the old and new chef.
  - In an effort to keep his pizza consistent, Pete wants to ensure that the average amount of pepperoni per slice has not changed with the hiring of his new chef. Using the confidence interval constructed in part (c), what would you tell Pete? Justify your answer.

- (2) Pete starts paying more attention to his new chef and notices that he seems to be dropping a lot of pizzas while tossing them. He looks at his records from his old chef and discovers that, in a simple random sample of 50 pizzas, the old chef dropped 5 pizzas. Pete finds that in an SRS of 50 pizzas the *new* chef dropped 10 pizzas.

- Pete decides that he will fire his new chef if this difference is significant at the 5% level. Should the new chef file for unemployment? (Don't forget to do a full process here!)

- (3) The Panther Prowler just published the results of a recent student poll asking an SRS of 10 girls and 10 boys if they like Justin Bieber. Eight girls reported that they like Justin while 2 boys reported that they were Beliebers. Is there a significant difference in opinions between boys and girls?

- What procedure would you use to answer this question?
- State the appropriate hypotheses.
- Check the conditions required to carry out the procedure you chose in part (a). Have we satisfied the necessary conditions to carry out the procedure?

- (4) Mrs. Skaff believes that printing tests on colored paper improves test scores. To test this theory, she randomly assigns half of her AP Statistics student to take a test on colored paper and gives the other half of her students a test on boring white paper. The results are listed below.

	n	$\bar{x}$	s
Colored Paper	24	82.5	5.2
White Paper	25	78.3	6.1

- State the appropriate procedure to test Mrs. Skaff's claim, then state the parameters and appropriate hypotheses.
- Check the conditions required to carry out the procedure you chose in part (a). Have we satisfied the necessary conditions to carry out the procedure?
- Describe how you could make this a matched pairs experiment. What procedure would you use in this case?

- (5) An SRS of 45 male employees at a large company found that 36 felt that the company was supportive of female and minority employees. An independent SRS of 40 female employees found that 24 felt that the company was supportive of female and minority employees. Let  $p_1$  represent the proportion of all male employees members at the company and  $p_2$  represent the proportion of all female employees members at the company who hold this opinion. We wish to test the hypotheses

$$H_0: p_1 - p_2 = 0 \quad \text{vs.} \quad H_a: p_1 - p_2 > 0$$

- Write the appropriate formula for the test statistic and make the correct substitutions.
- Write the appropriate formula for a 99% confidence interval and make the correct substitutions.

- (6) Some researchers have conjectured that stem-pitting disease in peach tree seedlings might be controlled with weed and soil treatment. An experiment was conducted to compare peach tree seedling growth with soil and weeds treated with one of two herbicides. In a field containing 20 seedlings, 10 were randomly selected from throughout the field and assigned to receive Herbicide A. The remaining 10 seedlings were to receive Herbicide B. Soil and weeds for each seedling were treated with the appropriate herbicide, and at the end of the study period, the height (in centimeters) was recorded for each seedling. A box plot of each data set showed no indication of non-Normality. The following results were obtained:

	$\bar{x}$ (cm)	S (cm)
Herbicide A	94.5	10
Herbicide B	109.1	9

- Write the appropriate formula for the test statistic and make the correct substitutions.
- Write the appropriate formula for an 85% confidence interval and make the correct substitutions.

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New Chef	Old Chef
32, 36, 39, 28, 25, 26, 28, 32, 34, 35	28, 36, 38, 42, 36, 34, 31, 32, 40, 33

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- a. What procedure would you use to answer this question?
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- $$H_0: p_1 - p_2 = 0 \quad \text{vs.} \quad H_a: p_1 - p_2 > 0$$
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- c. Write the appropriate formula for the test statistic and make the correct substitutions.
- d. Write the appropriate formula for an 85% confidence interval and make the correct substitutions.