

Name:

Partners:

Math Academy I

Date:

Review 9 Version A

[A] Circle whether each statement is true or false.

T F 1. $s_{\bar{x}} > s$

T F 2. $P(z < 1) \approx 34\%$

T F 3. $P(0.85 < z < 2.89) \approx 61\%$

T F 4. Age would be measured using an index.

T F 5. Die rolls are approximately normally distributed.

T F 6. P values are only meaningful for events that were predicted.

T F 7. A p value is the probability of the null hypothesis being true.

T F 8. A p value is the probability of the null hypothesis being false.

T F 9. The larger p is, the more likely the researcher's prediction is correct.

T F 10. If the null hypothesis is true, the probability of making a type I error is .05.

T F 11. Averages of 30 dice rolled at a time are approximately normally distributed.

T F 12. Given a normal distribution with $\mu = 40$, $P(\bar{x} > 45)$ is greater if n is 20 than if n is 8.

T F 13. A p value is the probability of the null hypothesis being true, given the null was rejected.

T F 14. Fewer than 60% heads is more likely in a sample of 100 coins than in a sample of 40 coins.

T F 15. If $p = .08$ in a right tailed test, that same test would have $p = .16$ if it had been two-tailed and $p = .92$ if it had been left-tailed.

[B] Assume scores on a math placement test are normally distributed with $\sigma = 30$.

1. Given $\mu = 100$, what percentage of scores are between 85 and 123?

2. Given $\mu = 100$, what is the probability that the average of 24 random scores is below 110?

3. How high of a sample mean for 24 people would be needed to conclude in a one-tailed test that the true mean is actually higher than 100?

[C] For each hypothesis, state why the indicated type of statistical test would not work. Then state the type of statistical test that would be appropriate.

1. Getting a pet makes people happier.

t test of two means

2. More voters support Kiesby than Johnson.

z test of two proportions

3. Some tests in this class are more difficult than others.

t test of two means

4. Some brands of cars are more likely to be certain colors.

r test of a correlation

5. Students who go to study sessions score higher on tests.

r test of a correlation

6. Republicans are more likely than Democrats to say that Trump has good moral character.

χ^2 goodness of fit test

7. Lifespans of Duracell AA batteries are more consistent than lifespans of Energizer AA batteries.

t test of two means

8. People tend to spend less money on fresh fruits and vegetables the more they spend on sodas and candy.

z test of two proportions

[D] Click on the Spreadsheet Data Set link on the class website, got to sheet A, and use the data to do the stated test. State the conclusion, followed by the calculated statistic (z , t , r , χ^2 , or F) and the p value.

1. Is online quiz 9A either more or less difficult than online quiz 9C? Use a two-tailed z test of a mean difference.

[E] Do the following to organize your group's reviews.

1. Make sure your name and your partners' names are at the top of your review the first day.

2. Staple the reviews in order, all facing the same way. Put the staple in the very top left corner if everyone is finished or if the review is due; otherwise put the staple in the top right corner.

Name:

Math Academy I

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Review 9 Version B

[A] Circle whether each statement is true or false.

- T F 1. $s_{\bar{x}} > s$
- T F 2. $P(z < 1) \approx 34\%$
- T F 3. $P(0.85 < z < 2.89) \approx 61\%$
- T F 4. Age would be measured using an index.
- T F 5. Die rolls are approximately normally distributed.
- T F 6. P values are only meaningful for events that were predicted.
- T F 7. A p value is the probability of the null hypothesis being true.
- T F 8. A p value is the probability of the null hypothesis being false.
- T F 9. The larger p is, the more likely the researcher's prediction is correct.
- T F 10. If the null hypothesis is true, the probability of making a type I error is .05.
- T F 11. Averages of 30 dice rolled at a time are approximately normally distributed.
- T F 12. Given a normal distribution with $\mu = 40$, $P(\bar{x} > 45)$ is greater if n is 20 than if n is 8.
- T F 13. A p value is the probability of the null hypothesis being true, given the null was rejected.
- T F 14. Fewer than 60% heads is more likely in a sample of 100 coins than in a sample of 40 coins.
- T F 15. If $p = .08$ in a right tailed test, that same test would have $p = .16$ if it had been two-tailed and $p = .92$ if it had been left-tailed.

[B] Assume scores on a math placement test are normally distributed with $\sigma = 30$.

1. Given $\mu = 125$, what percentage of scores are between 85 and 123?
2. Given $\mu = 125$, what is the probability that the average of 24 random scores is below 110?
3. How high of a sample mean for 24 people would be needed to conclude in a one-tailed test that the true mean is actually higher than 125?

[C] For each hypothesis, state why the indicated type of statistical test would not work. Then state the type of statistical test that would be appropriate.

1. Getting a pet makes people happier.

t test of two means

2. More voters support Kiesby than Johnson.

z test of two proportions

3. Some tests in this class are more difficult than others.

t test of two means

4. Some brands of cars are more likely to be certain colors.

r test of a correlation

5. Students who go to study sessions score higher on tests.

r test of a correlation

6. Republicans are more likely than Democrats to say that Trump has good moral character.

χ^2 goodness of fit test

7. Lifespans of Duracell AA batteries are more consistent than lifespans of Energizer AA batteries.

t test of two means

8. People tend to spend less money on fresh fruits and vegetables the more they spend on sodas and candy.

z test of two proportions

[D] Click on the Spreadsheet Data Set link on the class website, got to sheet B, and use the data to do the stated test. State the conclusion, followed by the calculated statistic (z , t , r , χ^2 , or F) and the p value.

1. Do people match the color of a color word faster than the meaning of a color word? Use a one-tailed z test of a mean difference.

[E] Bonus.

1. Solange rolls four 8-sided dice and finds the average. What is her expected result, and what result is least likely?

2. Explain how your answer above justifies a certain answer in part [A].

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Math Academy I

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Review 9 Version C

[A] Circle whether each statement is true or false.

- T F 1. $s_{\bar{x}} > s$
- T F 2. $P(z < 1) \approx 34\%$
- T F 3. $P(0.85 < z < 2.89) \approx 61\%$
- T F 4. Age would be measured using an index.
- T F 5. Die rolls are approximately normally distributed.
- T F 6. P values are only meaningful for events that were predicted.
- T F 7. A p value is the probability of the null hypothesis being true.
- T F 8. A p value is the probability of the null hypothesis being false.
- T F 9. The larger p is, the more likely the researcher's prediction is correct.
- T F 10. If the null hypothesis is true, the probability of making a type I error is .05.
- T F 11. Averages of 30 dice rolled at a time are approximately normally distributed.
- T F 12. Given a normal distribution with $\mu = 40$, $P(\bar{x} > 45)$ is greater if n is 20 than if n is 8.
- T F 13. A p value is the probability of the null hypothesis being true, given the null was rejected.
- T F 14. Fewer than 60% heads is more likely in a sample of 100 coins than in a sample of 40 coins.
- T F 15. If $p = .08$ in a right tailed test, that same test would have $p = .16$ if it had been two-tailed and $p = .92$ if it had been left-tailed.

[B] Assume scores on a math placement test are normally distributed with $\sigma = 30$.

1. Given $\mu = 131$, what percentage of scores are between 85 and 123?
2. Given $\mu = 131$, what is the probability that the average of 24 random scores is below 110?
3. How low of a sample mean for 24 people would be needed to conclude in a one-tailed test that the true mean is actually lower than 131?

[C] For each hypothesis, state why the indicated type of statistical test would not work. Then state the type of statistical test that would be appropriate.

1. Getting a pet makes people happier.

t test of two means

2. More voters support Kiesby than Johnson.

z test of two proportions

3. Some tests in this class are more difficult than others.

t test of two means

4. Some brands of cars are more likely to be certain colors.

r test of a correlation

5. Students who go to study sessions score higher on tests.

r test of a correlation

6. Republicans are more likely than Democrats to say that Trump has good moral character.

χ^2 goodness of fit test

7. Lifespans of Duracell AA batteries are more consistent than lifespans of Energizer AA batteries.

t test of two means

8. People tend to spend less money on fresh fruits and vegetables the more they spend on sodas and candy.

z test of two proportions

[D] Click on the Spreadsheet Data Set link on the class website, got to sheet C, and use the data to do the stated test. State the conclusion, followed by the calculated statistic (z , t , r , χ^2 , or F) and the p value.

1. Does order influence the difference between time to identify colors of color words and time to match meanings of color words? Use a two-tailed z test of a mean difference.

[E] Bonus.

1. Calder hypothesizes that more than 60% of people have more than one arm. If he uses a sample size of 2, what will be his p value and what will he conclude?

2. Explain how your answer above justifies a certain answer in part [A].

Name:

Math Academy I

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Review 9 Version D

[A] Circle whether each statement is true or false.

- T F 1. $s_{\bar{x}} > s$
- T F 2. $P(z < 1) \approx 34\%$
- T F 3. $P(0.85 < z < 2.89) \approx 61\%$
- T F 4. Age would be measured using an index.
- T F 5. Die rolls are approximately normally distributed.
- T F 6. P values are only meaningful for events that were predicted.
- T F 7. A p value is the probability of the null hypothesis being true.
- T F 8. A p value is the probability of the null hypothesis being false.
- T F 9. The larger p is, the more likely the researcher's prediction is correct.
- T F 10. If the null hypothesis is true, the probability of making a type I error is .05.
- T F 11. Averages of 30 dice rolled at a time are approximately normally distributed.
- T F 12. Given a normal distribution with $\mu = 40$, $P(\bar{x} > 45)$ is greater if n is 20 than if n is 8.
- T F 13. A p value is the probability of the null hypothesis being true, given the null was rejected.
- T F 14. Fewer than 60% heads is more likely in a sample of 100 coins than in a sample of 40 coins.
- T F 15. If $p = .08$ in a right tailed test, that same test would have $p = .16$ if it had been two-tailed and $p = .92$ if it had been left-tailed.

[B] Assume scores on a math placement test are normally distributed with $\sigma = 30$.

1. Given $\mu = 76$, what percentage of scores are between 85 and 123?
2. Given $\mu = 76$, what is the probability that the average of 24 random scores is below 110?
3. How high or low of a sample mean for 24 people would be needed to conclude in a two-tailed test that the true mean is actually different than 76?

[C] For each hypothesis, state why the indicated type of statistical test would not work. Then state the type of statistical test that would be appropriate.

1. Getting a pet makes people happier.

t test of two means

2. More voters support Kiesby than Johnson.

z test of two proportions

3. Some tests in this class are more difficult than others.

t test of two means

4. Some brands of cars are more likely to be certain colors.

r test of a correlation

5. Students who go to study sessions score higher on tests.

r test of a correlation

6. Republicans are more likely than Democrats to say that Trump has good moral character.

χ^2 goodness of fit test

7. Lifespans of Duracell AA batteries are more consistent than lifespans of Energizer AA batteries.

t test of two means

8. People tend to spend less money on fresh fruits and vegetables the more they spend on sodas and candy.

z test of two proportions

[D] Click on the Spreadsheet Data Set link on the class website, got to sheet D, and use the data to do the stated test. State the conclusion, followed by the calculated statistic (z , t , r , χ^2 , or F) and the p value.

1. On average, do staff and room heads write longer or shorter responses to the question *What were the most fun or memorable parts of Haunted House* than tour guides, thriller, actors, and makeup artists? Use a two-tailed t test of two means.

[E] Bonus.

1. If all 43 online quizzes are equally difficult, how many type I errors would Ryan expect to make if he does a separate t test for every test against every other test?

2. Explain how your answer above justifies a certain answer in part [A].