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

T F   1. The size of the critical region is .05.

T F   2. If $p > .05$, the data are insignificant.

T F   3. If $p < .05$, the data are nonsignificant.

T F   4. Critical values of z are larger than critical values of t.

T F   5. If t is in the critical region, H_1 has been proven correct.

T F   6. If t is closer to 0 than t_0 is, the null hypothesis is rejected.

T F   7. If H_0 is true, the probability of making a type I error is .05.

T F   8. If H_0 is false, the probability of making a type I error is .05.

T F   9. Not all tests of means can use a within-participants design.

T F   10. P values are only meaningful for events that were predicted.

T F   11. If the null hypothesis is rejected, a type II error may have occurred.

T F   12. The larger p is, the more likely the researcher's prediction is correct.

T F   13. If the data are statistically significant, the null hypothesis is rejected.

T F   14. It is wrong to consider the data when deciding which tails to use in a test.

T F   15. In a two-tailed within-participants design, the null hypothesis is typically $\mu = 0$.

T F   16. Between-participants designs can use random assignment, but within-participants designs cannot.

T F   17. In a within-participants design, two separate sample means and sample standard deviations are calculated.

T F   18. The power of a test is the probability of rejecting the null hypothesis, given a specified alternate hypothesis is true.

T F   19. 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.

T F   20. The null hypothesis for a left-tailed test is the same as the alternate hypothesis for the same study done as a right-tailed test.

[B] For each problem, consider two tests of a single mean that are exactly the same in all possible aspects except the one stated. Circle which statistic would make it more likely to reject H_0.

1. $n = 20$ $n = 28$

2. $s = 4.5$ $s = 9.1$

3. $\beta = .20$ $\beta = .40$

4. t is used z is used

5. one-tailed   two-tailed

6. power = .60   power = .80

7. between-participants   within-participants

[C] For each of the following, justify which tail(s) you will use, shade the critical region, calculate *z* or *t*, and report the conclusion in the context of the problem, followed by *z* or *t* and a *p* value range.

1. In a survey to see which state has a higher rate of Trumpcare support, 54 out of 162 Colorado adults say they would prefer Trumpcare over Obamacare, and likewise for 65 out of 141 Nevada adults.
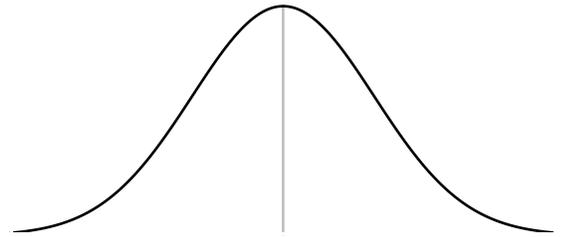
2. Marissa has six participants do a triple jump both with and without a fake energy supplement.

meters with fake energy supplement:	8.3	7.1	7.6	7.2	7.1	9.0
meters without fake energy supplement:	8.0	7.3	6.7	6.4	6.8	8.4
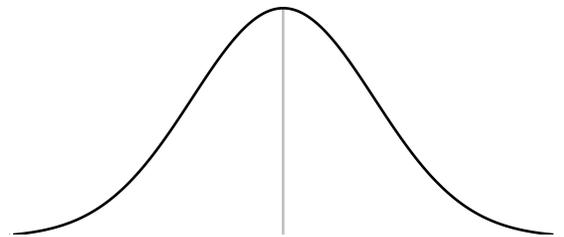
3. Ava asks Santa Cruz and San Jose residents how many minutes they spend outdoors each week. The 10 Santa Cruz residents surveyed averaged 322 minutes with standard deviation 111 minutes, and the 10 San Jose residents surveyed averaged 255 minutes with standard deviation 62 minutes.
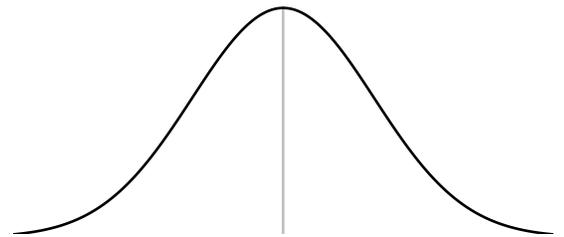
[D] Do the following to organize your group's reviews.
1. Make sure your name and your partners' names are at the top of your review the first day.
2. Staple the reviews in order, all facing the same way. Put the staple in the very top left corner if everyone is finished or if the review is due; otherwise put the staple in the top right corner.

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

T F   1. The size of the critical region is .05.

T F   2. If $p > .05$, the data are insignificant.

T F   3. If $p < .05$, the data are nonsignificant.

T F   4. Critical values of z are larger than critical values of t.

T F   5. If t is in the critical region, H_1 has been proven correct.

T F   6. If t is closer to 0 than t_0 is, the null hypothesis is rejected.

T F   7. If H_0 is true, the probability of making a type I error is .05.

T F   8. If H_0 is false, the probability of making a type I error is .05.

T F   9. Not all tests of means can use a within-participants design.

T F   10. P values are only meaningful for events that were predicted.

T F   11. If the null hypothesis is rejected, a type II error may have occurred.

T F   12. The larger p is, the more likely the researcher's prediction is correct.

T F   13. If the data are statistically significant, the null hypothesis is rejected.

T F   14. It is wrong to consider the data when deciding which tails to use in a test.

T F   15. In a two-tailed within-participants design, the null hypothesis is typically $\mu = 0$.

T F   16. Between-participants designs can use random assignment, but within-participants designs cannot.

T F   17. In a within-participants design, two separate sample means and sample standard deviations are calculated.

T F   18. The power of a test is the probability of rejecting the null hypothesis, given a specified alternate hypothesis is true.

T F   19. 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.

T F   20. The null hypothesis for a left-tailed test is the same as the alternate hypothesis for the same study done as a right-tailed test.

[B] For each problem, consider two tests of a single mean that are exactly the same in all possible aspects except the one stated. Circle which statistic would make it more likely to reject H_0.

1. $n = 20$ $n = 28$

2. $s = 4.5$ $s = 9.1$

3. $\beta = .20$ $\beta = .40$

4. t is used z is used

5. one-tailed   two-tailed

6. power = .60   power = .80

7. between-participants   within-participants

[C] For each of the following, justify which tail(s) you will use, shade the critical region, calculate z or t, and report the conclusion in the context of the problem, followed by z or t and a p value range.

1. In a survey to see which state has a higher rate of Trumpcare support, 81 out of 154 Indiana adults say they would prefer Trumpcare over Obamacare, and likewise for 66 out of 150 Kentucky adults.
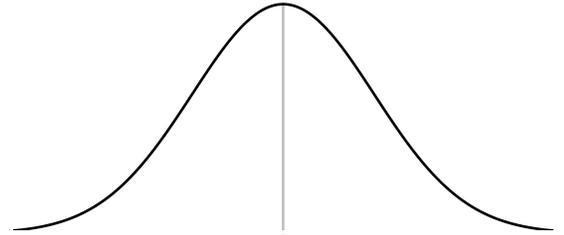
2. Marissa has six participants do a triple jump both with and without a fake energy supplement.

	6.8	7.5	7.9	8.0	6.0	6.9
meters with fake energy supplement:	6.8	7.5	7.9	8.0	6.0	6.9
meters without fake energy supplement:	6.3	7.0	7.6	8.0	6.2	6.3
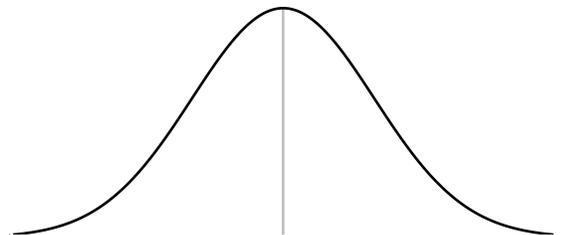
3. Ava asks Santa Cruz and San Jose residents how many minutes they spend outdoors each week. The 55 Santa Cruz residents surveyed averaged 301 minutes with standard deviation 104 minutes, and the 61 San Jose residents surveyed averaged 255 minutes with standard deviation 59 minutes.
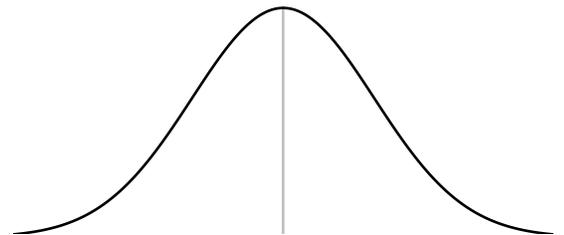
[D] Bonus. HP's website claims that their 51645A ink cartridges print an average of 840 pages. Kaden runs 30 of them in a left-tailed test.

1. Given $\sigma = 38$, how low does $\bar{x}$ need to be in order for Kaden to reject H_0?

2. Given $\mu = 828$ and $\sigma = 38$, calculate the probability of $\bar{x}$ being as low as what you calculated in #1.

3. What is the name for what you calculated in #2?

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

T F   1. The size of the critical region is .05.

T F   2. If $p > .05$, the data are insignificant.

T F   3. If $p < .05$, the data are nonsignificant.

T F   4. Critical values of z are larger than critical values of t.

T F   5. If t is in the critical region, H_1 has been proven correct.

T F   6. If t is closer to 0 than t_0 is, the null hypothesis is rejected.

T F   7. If H_0 is true, the probability of making a type I error is .05.

T F   8. If H_0 is false, the probability of making a type I error is .05.

T F   9. Not all tests of means can use a within-participants design.

T F   10. P values are only meaningful for events that were predicted.

T F   11. If the null hypothesis is rejected, a type II error may have occurred.

T F   12. The larger p is, the more likely the researcher's prediction is correct.

T F   13. If the data are statistically significant, the null hypothesis is rejected.

T F   14. It is wrong to consider the data when deciding which tails to use in a test.

T F   15. In a two-tailed within-participants design, the null hypothesis is typically $\mu = 0$.

T F   16. Between-participants designs can use random assignment, but within-participants designs cannot.

T F   17. In a within-participants design, two separate sample means and sample standard deviations are calculated.

T F   18. The power of a test is the probability of rejecting the null hypothesis, given a specified alternate hypothesis is true.

T F   19. 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.

T F   20. The null hypothesis for a left-tailed test is the same as the alternate hypothesis for the same study done as a right-tailed test.

[B] For each problem, consider two tests of a single mean that are exactly the same in all possible aspects except the one stated. Circle which statistic would make it more likely to reject H_0.

1. $n = 20$ $n = 28$

2. $s = 4.5$ $s = 9.1$

3. $\beta = .20$ $\beta = .40$

4. t is used z is used

5. one-tailed   two-tailed

6. power = .60   power = .80

7. between-participants   within-participants

[C] For each of the following, justify which tail(s) you will use, shade the critical region, calculate *z* or *t*, and report the conclusion in the context of the problem, followed by *z* or *t* and a *p* value range.

1. In a survey to see which state has a higher rate of Trumpcare support, 40 out of 96 Florida adults say they would prefer Trumpcare over Obamacare, and likewise for 69 out of 129 Ohio adults.
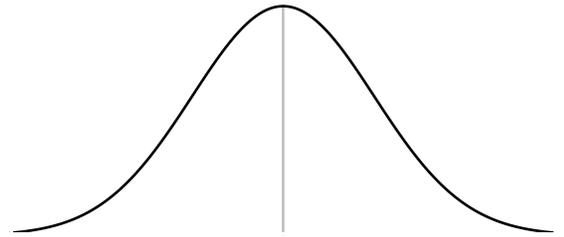
2. Marissa has six participants do a triple jump both with and without a fake energy supplement.

meters with fake energy supplement:	8.3	7.1	7.6	7.2	7.1	9.0
meters without fake energy supplement:	8.0	7.6	7.4	7.5	7.0	9.1
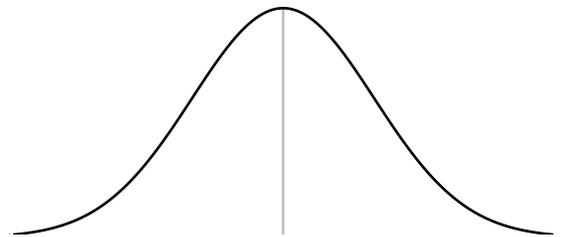
3. Ava asks nine Santa Cruz and nine San Jose residents how many minutes they spend outdoors each week.

Santa Cruz:	280	320	440	340	450	420	500	180	330
San Jose:	250	280	360	220	380	360	380	150	150
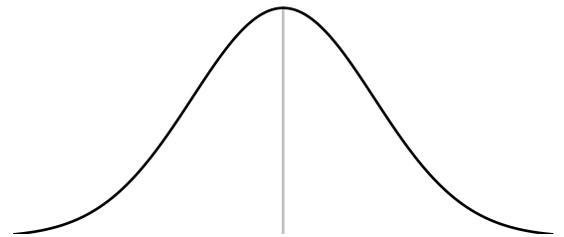
[D] Bonus. HP's website claims that their 51645A ink cartridges print an average of 840 pages. Kaden runs 30 of them in a left-tailed test.

1. Given $\sigma = 40$, how low does $\bar{x}$ need to be in order for Kaden to reject H_0?

2. Given $\mu = 828$ and $\sigma = 40$, calculate the probability of $\bar{x}$ being as low as what you calculated in #1.

3. What is the name for what you calculated in #2?

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

T F   1. The size of the critical region is .05.

T F   2. If $p > .05$, the data are insignificant.

T F   3. If $p < .05$, the data are nonsignificant.

T F   4. Critical values of z are larger than critical values of t.

T F   5. If t is in the critical region, H_1 has been proven correct.

T F   6. If t is closer to 0 than t_0 is, the null hypothesis is rejected.

T F   7. If H_0 is true, the probability of making a type I error is .05.

T F   8. If H_0 is false, the probability of making a type I error is .05.

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T F   11. If the null hypothesis is rejected, a type II error may have occurred.

T F   12. The larger p is, the more likely the researcher's prediction is correct.

T F   13. If the data are statistically significant, the null hypothesis is rejected.

T F   14. It is wrong to consider the data when deciding which tails to use in a test.

T F   15. In a two-tailed within-participants design, the null hypothesis is typically $\mu = 0$.

T F   16. Between-participants designs can use random assignment, but within-participants designs cannot.

T F   17. In a within-participants design, two separate sample means and sample standard deviations are calculated.

T F   18. The power of a test is the probability of rejecting the null hypothesis, given a specified alternate hypothesis is true.

T F   19. 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.

T F   20. The null hypothesis for a left-tailed test is the same as the alternate hypothesis for the same study done as a right-tailed test.

[B] For each problem, consider two tests of a single mean that are exactly the same in all possible aspects except the one stated. Circle which statistic would make it more likely to reject H_0.

1. $n = 20$ $n = 28$

2. $s = 4.5$ $s = 9.1$

3. $\beta = .20$ $\beta = .40$

4. t is used z is used

5. one-tailed   two-tailed

6. power = .60   power = .80

7. between-participants   within-participants

[C] For each of the following, justify which tail(s) you will use, shade the critical region, calculate *z* or *t*, and report the conclusion in the context of the problem, followed by *z* or *t* and a *p* value range.

1. In a survey to see which state has a higher rate of Trumpcare support, 92 out of 206 California adults say they would prefer Trumpcare over Obamacare, and likewise for 49 out of 145 Texas adults.
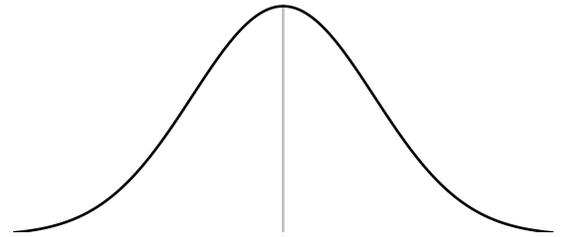
2. Marissa has six participants do a triple jump both with and without a fake energy supplement.

meters with fake energy supplement:	8.6	8.9	8.5	8.1	8.0	9.1
meters without fake energy supplement:	8.0	8.2	7.9	7.6	7.7	8.4
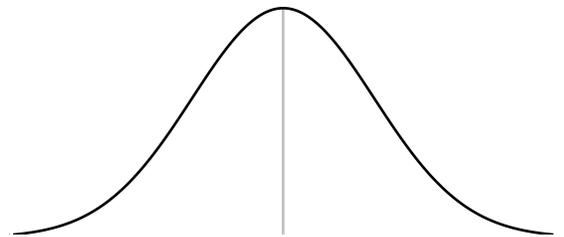
3. Ava asks nine Santa Cruz and nine San Jose residents how many minutes they spend outdoors each week.

Santa Cruz:	260	320	440	130	450	420	500	180	150
San Jose:	250	280	360	220	380	360	380	150	150
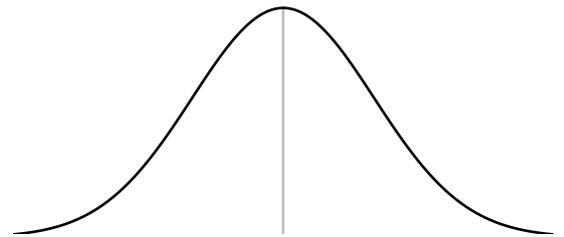
[D] Bonus. HP's website claims that their 51645A ink cartridges print an average of 840 pages. Kaden runs 30 of them in a left-tailed test.

1. Given $\sigma = 42$, how low does $\bar{x}$ need to be in order for Kaden to reject H_0?

2. Given $\mu = 828$ and $\sigma = 42$, calculate the probability of $\bar{x}$ being as low as what you calculated in #1.

3. What is the name for what you calculated in #2?