

Warm Up

- more Inference Selection Practice
(5 and 6 only)

- CI or Significance Test ?

- Mean or Proportion ?

- 2 sample or 1

├ Paired
└ Unpaired

5

Researchers were studying how playing a dancing video game impacts heart rate. They measured the heart rates (in beats per minute) of 15 subjects before they danced a song and again after they finished dancing the song. They want to use these results to estimate the average difference between before and after heart rates.

Which of these inference procedures is most appropriate?

Choose 1 answer:

A z -interval for a proportion

B A two-sample t -interval for the difference of means

C A paired t -interval for the mean difference

D A two-sample z -interval for the difference of proportions

E A t -interval for slope



INCORRECT

A z -interval for a proportion

The researchers aren't categorizing the heart rates, so proportions wouldn't be appropriate.



INCORRECT

A two-sample t -interval for the difference of means

The before heart rates are **not** independent of the after heart rates, so we shouldn't treat them as two separate samples.



CORRECT (SELECTED)

A paired t -interval for the mean difference

The researchers recorded two measurements on each subject. They should calculate the difference between the two heart rates for each subject, and do a test on the mean of those differences.



6.

A website streams movies and television shows to millions of users. Employees know that the average time a user spends per session on their website is 2 hours. The website changed its design, and they wanted to know if the average session length was longer than 2 hours. They randomly sampled 100 users and recorded their session lengths.

Which of these inference procedures is most appropriate?

Choose 1 answer:

- (A) A paired t -test for the mean difference
- (B) A two-sample t -test for the difference of means
- (C) A t -test for a mean
- (D) A z -test for a proportion
- (E) A two-sample z -test for the difference of proportions

INCORRECT

A paired t -test for the mean difference

The employees collected one data point (the session length) for each user in the sample, so they don't have paired data.

INCORRECT

A two-sample t -test for the difference of means

The employees are looking at one sample of data, not two.



CORRECT (SELECTED)

A t -test for a mean

The employees are interested in the *average* session length, so t procedures for a *mean* are appropriate. They are comparing the mean of a single sample to a hypothesized value, so two-sample procedures aren't appropriate.

7.

Felipe is curious if there is a relationship between a runner's age and their finishing time in a recent marathon. He takes a random sample of finishers and records the age (in years) and the finishing time (in minutes) for each of those sampled.

Which of these inference procedures is most appropriate?

Choose 1 answer:

(A) A two-sample z -test for the difference of proportions

(B) A z -test for a proportion

(C) A paired t -test for the mean difference

(D) A t -test for slope

(E) A two-sample t -test for the difference of means

I don't expect
you to know this
yet

Felipe is curious if there is a relationship between a runner's age and their finishing time in a recent marathon. He takes a random sample of finishers and records the age (in years) and the finishing time (in minutes) for each of those sampled.

Which of these inference procedures is most appropriate?

Choose 1 answer:

A A two-sample z -test for the difference of proportions

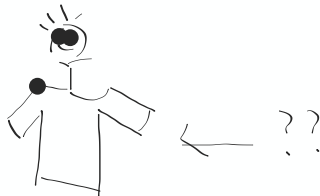
B A z -test for a proportion

C A paired t -test for the mean difference

D A t -test for slope

E A two-sample t -test for the difference of means

Inaugural AP Statistics
class at Sheldon HS.



Agenda

- ≈ Catch our breath before going down the home stretch of AP Stats (ch.11, ch.12)
- ≈ Start to review all of AP Stats before we do a more methodical review in late February.



Cumulative AP Practice
Test

Advice - Do a quick look back in your book.
 [will be re-establish connections]

- check answers as you go
- Struggling a bit is ok
- Look at partial (my messy) solutions on some

Yesterday AP 3.1 → 3.10 , 33

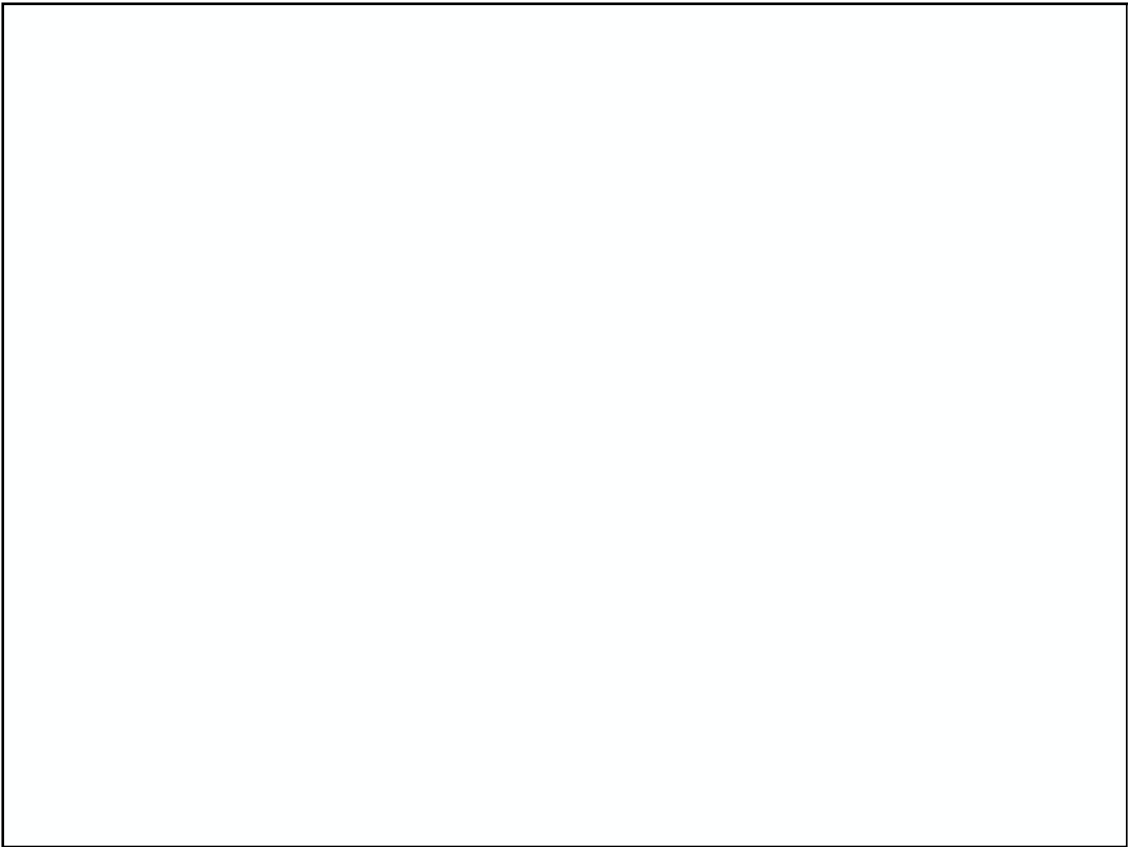
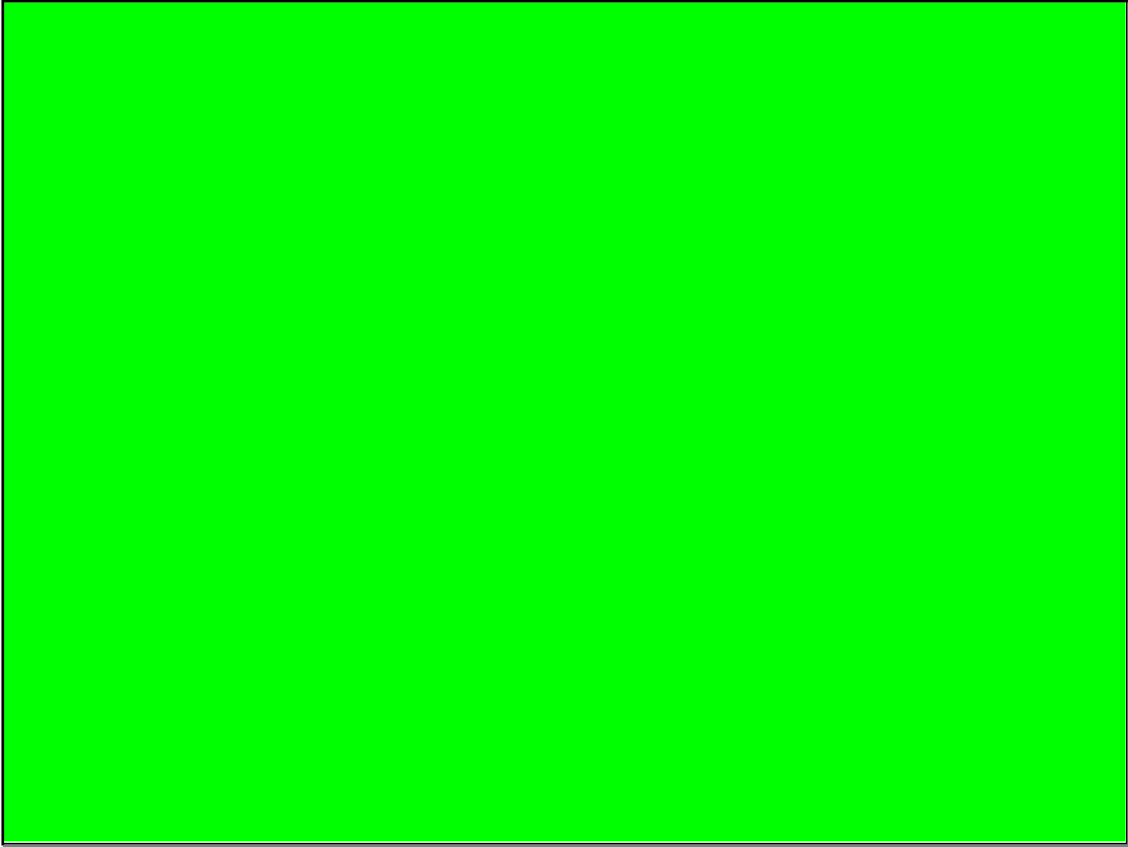
Today (and tonight) AP 3.11 → 3.25 , 34

Tomorrow (shorter classes) AP 3.26 → 3.30 , 35

Work to be turned in Monday

	<u>Section</u>		<u>Section</u>		<u>Section</u>
3.1	6.3	11		21	
2	5.2/5.3	12	3.1	22	8.1 / 8.2
3	8.2	13	10.1	23	3.2
4	2.2	14	6.3	24	
5	9.3	15		25	9.3
6	4.1	16		26	4.1
7	6.3	17		27	6.3
8	8.1	18	8.1 p.501	28	
9	4.2	19	3.2 p.190	29	
10	6.3	20		30	

Brain Break
in about 20 minutes



Angelica surveyed 150 people in the 20-29 age group and 150 people in the 30-39 age group about whether or not they were vegetarian. She wants to estimate the difference between the percentage of people in each group who are vegetarian.

Which of these inference procedures is most appropriate?

A t -interval for slope

A two-sample z -interval for the difference of proportions

A z -interval for a proportion

A two-sample t -interval for the difference of means

A t -interval for a mean

INCORRECT

A t -interval for slope

This type of interval is useful for estimating the slope of a regression line, but Angelica isn't looking at the relationship between two quantitative variables.

CORRECT (SELECTED)

A two-sample z -interval for the difference of proportions

Angelica has two groups (150 people from each age group) and she's comparing a *categorical* variable (vegetarian or not) between the two groups, so *proportions* are appropriate.

INCORRECT

A z -interval for a proportion

Angelica's data came from two groups (150 people from each age group), so two-sample procedures are appropriate.

A two-sample t -interval for the difference of means

Angelica is looking at a *categorical* variable, so using *proportions* is more appropriate than means.



INCORRECT

A t -interval for a mean

Angelica is looking at a *categorical* variable, so using *proportions* is more appropriate than means. Also, she has two groups, so two-sample procedures are appropriate.



INCORRECT

A z -test for a proportion

The employees are interested in the *average* session length, so they should use t procedure for a *mean*. They aren't categorizing the lengths, so proportions wouldn't be appropriate.



INCORRECT

A two-sample z -test for the difference of proportions

The employees are looking at one sample of data, not two. Also, they are interested in the *average* session length, so they should use t procedures for a *mean*. They aren't categorizing the lengths, so proportions wouldn't be appropriate.



INCORRECT

A two-sample z -interval for the difference of proportions

The researchers aren't categorizing the heart rates, so proportions wouldn't be appropriate.



INCORRECT

A t -interval for slope

This would be useful if the researchers were interested in the relationship between before and after heart rates in a scatter plot, but it wouldn't be the best way to estimate the average difference.



CORRECT (SELECTED)

A paired t -interval for the mean difference

The researchers recorded two measurements on each customer. They should calculate the difference between the two scores for each customer, and do a test on the mean of those differences.



INCORRECT

A two-sample z -interval for the difference of proportions

The researchers aren't categorizing the scores, so proportions wouldn't be appropriate.



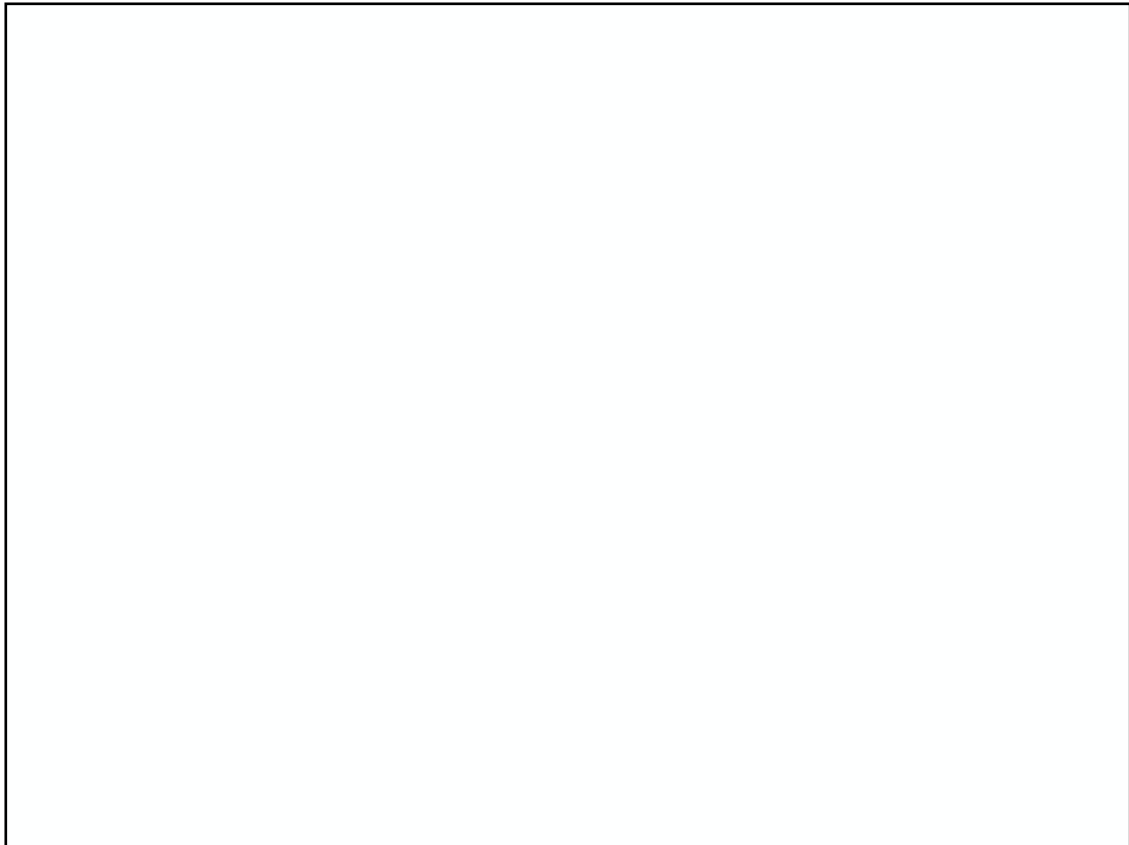
INCORRECT

A z -interval for a proportion

The researchers aren't categorizing the scores, so proportions wouldn't be appropriate.



INCORRECT

A two-sample t -interval for the difference of meansThe before scores are **not** independent of the after scores, so we shouldn't treat them as two separate samples.

A school counselor suspects that, on average, students at their school are sleeping less than 8 hours per night. They survey a random sample of students about how many hours they slept the previous night to see if their average sleep amount is significantly less than 8 hours.

Which of these inference procedures is most appropriate?

Choose 1 answer:

- A A two-sample z -test for the difference of proportions
- B A paired t -test for the mean difference
- C A z -test for a proportion
- D A t -test for a mean
- E A two-sample t -test for the difference of means

CORRECT (SELECTED)

A t -test for a mean

The counselor is interested in the *average* sleep amount, so t procedures for a *mean* are appropriate. They are comparing the mean of a single sample to a hypothesized value, so two-sample procedures aren't appropriate.

⊖ INCORRECT

A two-sample z -test for the difference of proportions

The counselor is looking at one sample of data, not two. Also, they are interested in the *average* sleep amount, so they should use t procedures for a *mean*. They aren't categorizing the sleep amounts, so proportions wouldn't be appropriate.

⊖ INCORRECT

A paired t -test for the mean difference

The counselor collected one data point (the sleep amount) for each student in the sample, so they don't have paired data.

⊖ INCORRECT

A z -test for a proportion

The counselor is interested in the *average* sleep amount, so they should use t procedures for a *mean*. They aren't categorizing the sleep amounts, so proportions wouldn't be appropriate.

⊖ INCORRECT

A two-sample t -test for the difference of means

The counselor is looking at one sample of data, not two.

