Student 1

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$. $n = 32$

A) Calculate the mean.

$\bar{x} = 19.125$

B) Calculate the standard deviation.

$s_x = 7.439$

C) What is the median of this dataset?

Med = 19.500

D) Are the values calculated in parts A-C parameters or statistics? Why? Statistics, since they come from a sample dataset.

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. T-int 2

(16.895, 21.355)

F) How did you determine the correct procedure to use in part E?

Utilize T-interval due to the fact that we have sample data, so we know "s" not "σ". If we knew the population standard deviation, we would use Z-interval.

G) Interpret the interval you calculated in part E.

We are 90% confident that the true mean amount of time that WKU students spend studying for finals each semester lies within 16.895 and 21.355 hours.

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 2

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

$\bar{X} = 19.125$

B) Calculate the standard deviation.

$s = 7.439$

C) What is the median of this dataset?

med = 19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

Statistics because the data is a sample

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.295, 21.955)

F) How did you determine the correct procedure to use in part E?

because we do not know σ

G) Interpret the interval you calculated in part E.

We are 90% confident that the true mean of 19.125 is between 16.295 and 21.955.

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

The true mean amount of time that WKU students spend studying for finals is less than 20 hours.

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 3

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

$\bar{x} = 19.125$

B) Calculate the standard deviation.

$s = 7.439$

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

Statistics because it is a sample

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

T-Interval (16.895, 21.355)

F) How did you determine the correct procedure to use in part E?

Use T because σ is not known.

G) Interpret the interval you calculated in part E.

We are 90% confident the true mean for the amount of time WKU students spend studying for finals each semester is between 16.895 and 21.355 hours.

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 4

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.094

B) Calculate the standard deviation.

7.389

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

Stats bc they are taken from a sample

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

Tinterval

(16.879, 21.309)

F) How did you determine the correct procedure to use in part E?

I used T interval bc we dont know σ

G) Interpret the interval you calculated in part E.

I am 90% confident that the mean amount of time studying is b/w 16.876 + 21.309 hours

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = \mu = 20$

$H_1 = \mu < 20$

Student 5

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

$\bar{x} = 19.125$

B) Calculate the standard deviation.

$S = 7.439$

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

statistics because we are using sample data

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

F) How did you determine the correct procedure to use in part E?

I determined to use the TInterval because the problem is talking about the mean.

G) Interpret the interval you calculated in part E.

We are 90% confident that the true mean amount of time when students spend studying for finals is between 16.895 and 21.355.

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Fail to reject because the interval includes numbers higher than 20.

Student 6

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.125

B) Calculate the standard deviation.

7.439

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

Statistics, it is a sample

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. T-INT

$16.895 < \mu < 21.355$

F) How did you determine the correct procedure to use in part E?

T-interval because σ is not known.

G) Interpret the interval you calculated in part E.

We are 90% confident that the true population mean is between 16.895 and 21.355.

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 7

MATH 183 Confidence Interval Quiz

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" Round you answers to **three** decimal places. The results are as follows:

5	6	11	12	12	12	13	14	14	15	15
16	18	18	18	19	20	20	20	20	20	21
21	21	22	25	26	27	28	31	32	40	

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.125

B) Calculate the standard deviation.

7.439

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts A-C parameters or statistics? Why?

Statistics because is a sample

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

F) How did you determine the correct procedure to use in part E?

T-Interval

G) Interpret the interval you calculated in part E.

We are 90% confident that our true mean value is between 16.895 (LB) and 21.355 (UB)

H) Suppose you wanted to test if the true mean amount of time that WKU students studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 8

1. Use the information below to answer parts a through h.

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19
20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean. 19.13

b. Calculate the standard deviation.

$s = \sqrt{\frac{13420}{32-1}}$ $\sqrt{\frac{13420}{31}}$ $\sqrt{432.9032258}$ = 20.81

c. What is the median of this dataset?

19 to 20

d. Are the values calculated in parts a-c parameters or statistics? Why?

Statistic because it represents a sample

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e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

90% = 1.645
$n = 32$
$\bar{x} = 612$
$\hat{p}$ 19.125
$E = 4.30$
19.125 + 4.30
19.125 − 4.30
14.83 < p < 23.43

f. How did you determine the correct procedure to use in part e?

Used the margin of error formula then used $\hat{p} +/- E$ to solve for the confidence interval

g. Interpret the interval you calculated in part e.

WKU students spend more than 14.83 hrs but less than 23.43 hrs studying for finals with a 90% CFL.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

Do the students at WKU on average spend less than 20 hours studying for finals?

Student 9

1. Use the information below to answer parts a through h.

n=sample

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

$S = \sqrt{\frac{n\sum x^2 - (\sum x)^2}{n(n-1)}}$

a. Calculate the mean.

19.4

b. Calculate the standard deviation.

7.4

c. What is the median of this dataset?

19.5

d. Are the values calculated in parts a-c parameters or statistics? Why?

Statistics, because it's only describing a sample population. not entire

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

90% = 1.6445

$19.4 \pm 1.645\frac{7.4}{\sqrt{32}}$ $19.4+1.645\frac{7.4}{\sqrt{32}} = 21.5$ $19.4-1.645\frac{7.4}{\sqrt{32}} = 17.2$

19.4 ± 2.152, from 17.25 to 21.55

f. How did you determine the correct procedure to use in part e?

Because you always want to should start with finding your margin of error.

g. Interpret the interval you calculated in part e.

90% of population or sample is within the mean, which is between 17.25--21.55, making 10% not.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

When studying for finals we want to see if students who study less than 20 hours do better than those students who studied more than 20.

1

Student 10

1. Use the information below to answer parts a through h.

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

(n)

a. Calculate the mean.

$\frac{612}{32} = 19.13$

b. Calculate the standard deviation.

$s = \sqrt{\frac{n\sum x^2 - (\sum x)^2}{n(n-1)}} = s = \sqrt{\frac{612(13420) - (612)^2}{612(612-1)}} = 22.97$

c. What is the median of this dataset?

$\frac{19+20}{2} = 19.5$

d. Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because, it's a numerical measurement describing the sample.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$.9 \times 612 = 550.8$

f. How did you determine the correct procedure to use in part e?

I multiplied 90% as a decimal by the total number of the sample.

g. Interpret the interval you calculated in part e.

$\mu \pm 550.8$

$\mu = 550.8$

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H = 20$

$H < 20$

Student 11

1. Use the information below to answer parts a through h.

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

$n = 32$

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

$s = \sqrt{\frac{13420 - 612}{32(31)}} = \sqrt{\frac{12808}{992}}$

$= 3.6$

a. Calculate the mean.

$612 / 32 = 19.125$

b. Calculate the standard deviation.

3.6

c. What is the median of this dataset?

19

d. Are the values calculated in parts a-c parameters or statistics? Why?

Parameter because we know the sample size

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e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$\frac{12808}{992} = 12.91$ $\quad p$ $\quad 1 - 12.91 = 11.91$

$\sqrt{\frac{12.91 \cdot 11.91}{992}} = .3937(0.10) = \boxed{.3937}$

f. How did you determine the correct procedure to use in part e?

90% is 0.10 so I took 12808/992 to find $\hat{p}$ then took $\hat{p}$ and subtract 1 to get ε (11.91) then did the formula

g. Interpret the interval you calculated in part e.

$z = 0.20 = 1.96$

$\varepsilon = 1.96\sqrt{\frac{12808 \cdot 612}{13420}} = \frac{7838496}{13420} = \boxed{24.17}$

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$\hat{p} - \varepsilon < p < \hat{p} + \varepsilon$ $\quad p = 20$ $\quad \hat{p} = 1291$ $\quad \varepsilon = 0.39$

Students spend about 15 and a half hrs studying

$1291 - 0.39 < 20 < 1291 + 0.39$

$1290.61 < 20 < 1291.39 = 15.6$

Student 12

10. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a) (2 pts) Calculate the mean. 19.125

b) (2 pts) Calculate the standard deviation. 7.439

c) (2 pts) What is the median of this dataset? 19.5

d) (2 pts) Are the values calculated in parts a)—c) parameters or statistics? Why?

Statistics; the calculated parts are from using data from a sample

e) (3 pts) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

TInterval $\bar{x}$=19.125
S_x=7.438...
n=32
(16.895, 21.355)

f) (2 pts) How did you determine the correct procedure to use in part e)?

whether or not σ is known. In this case, σ is not known so we use T Interval

g) (3 pts) Interpret the interval you calculated in part e).

We are 90% confident that the true mean amount of study time is between the interval (16.895, 21.355)

h) (3 pts) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? < 20

altern. = $\mu < 20$ The true mean amount of time will be less than 20 hours

null = $\mu = 20$ There will be no change in the mean

Student 13

$\sigma x = 3.21\,84$

10. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a) (2 pts) Calculate the mean. 19.125

b) (2 pts) Calculate the standard deviation. 7.438999 259

c) (2 pts) What is the median of this dataset? 19.5

d) (2 pts) Are the values calculated in parts a)—c) parameters or statistics? Why?

They are stastics b/c it was taken out of a sample not the whole WKU population.

e) (3 pts) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.973, 21.277)

f) (2 pts) How did you determine the correct procedure to use in part e)?

use ZInterval test on calculator look at the stats that are provided/found

g) (3 pts) Interpret the interval you calculated in part e).

We are 90% sure that the confidence Interval (16.973, 21.277) contains the true mean amount of time that WKU students spend studying for finals each semester.

h) (3 pts) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

H_1 The mean weight for students studying for finals each semester is less than 20.

$M < 0$

Student 14

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$612/32 = 19.125 \approx 19.1$

b) Calculate the standard deviation.

$$s = \sqrt{\frac{32(13420) - 13420}{32(32-1)}} = 20.478 \approx 20.5$$

c) What is the median of this dataset?

$$\frac{19+20}{2} = 19.5$$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

They are parameters because they measure a property of a population.

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$32 \geq 30$ $z_{0.90} = 1.645$

$1.645 \times \frac{20.5}{\sqrt{32}} = 5.96 \approx 6.0$

$E \pm \bar{x}$

$19.1 - 6 = 13.1$

$19.1 + 6 = 25.1$

f) How did you determine the correct procedure to use in part e)?

The population was greater than 30 and I needed the confidence interval so I followed the steps associated.

g) Interpret the interval you calculated in part e).

We are 90% sure that the true amount of time that students spend studying is between 13.1 + 25.1 hours.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$, $H_a: \mu < 20$

Student 15

Suppose that 32 WKU students are randomly selected and asked, ··How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15. 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\bar{x} = \frac{\sum x}{n} = 19.1$

b) Calculate the standard deviation.

$\sqrt{\frac{(612 - 19.1)^2}{32-1}} = 7.44$

c) What is the median of this dataset?

20+19/2 = 19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

statistic because it's a property of a sample

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$\xi = z_{0.90} \frac{s}{\sqrt{n}} = 1.645 \frac{7.44}{32} = 0.38$

19.1 - 0.38 = 18.72 19.1 + 0.38 = 19.48

f) How did you determine the correct procedure to use in part e)?

the population standard deviation is Unknown

g) Interpret the interval you calculated in part e).

90% confident obtained confidence interval does contain true value of sample mean 19.1

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_a: \mu < 20$

Student 16

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 8 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\mu = 19.125$

b) Calculate the standard deviation.

$$\frac{612 - 19.125}{32 - 1} = \frac{592.875}{31} = 19.125$$

c) What is the median of this dataset?

$(19+20) \div 2 = 19.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

a statistic, because it is a numerical measurement about some property of a sample & not a population.

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

1. Sample random & ≥ 30? yes.

2. $E = z_c \frac{\sigma}{\sqrt{n}}$

3. $E = z_{0.90} \frac{19.25}{\sqrt{32}} \rightarrow 1.645 \frac{19.25}{\sqrt{32}} = 5.59$

4. $(\bar{x} - E, \bar{x} + E) \rightarrow (19.25 - 5.59, 19.25 + 5.59)$

$(13.65, 24.85)$

f) How did you determine the correct procedure to use in part e)?

I knew to use the formula above because the question stated to find the "confidence interval."

g) Interpret the interval you calculated in part e).

We are 90% confident that the true mean amount of time a WKU student spend studying for finals each semester is between 13.65 hours & 24.85 hours.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 \rightarrow \mu = 20$

$H_a \rightarrow \mu < 20$

Student 17

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$612 / 32 = 19.125$

b) Calculate the standard deviation.

$S = \sqrt{\frac{13420 - \frac{(612)^2}{32}}{32-1}} = 7.439$

c) What is the median of this dataset?

$19 + 20 / 2 = 29$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$z_{0.90} = 1.645$

$1.645 \times \frac{7.439}{\sqrt{32}} = 2.163$

$(19.125 - 2.163, 19.125 + 2.163) = (16.926, 21.288)$

f) How did you determine the correct procedure to use in part e)?

Followed the steps 1) condition 2) margin of error 3) confidence interval

To get confidence interval you must find margin of error (E) first.

g) Interpret the interval you calculated in part e).

We are 90% confident the true mean is between 16.926 & 21.288

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_a = \mu < 20$, left tailed $H_0 = 20$

Student 18

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\bar{x} = 19.125$ Add all up /32

b) Calculate the standard deviation.

STD = 7.439

c) What is the median of this dataset?

Med = 19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Yes, statistics

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

32230

90% = (1.65)

Conditions =
- Sample is random

Margin of error = sigma quantum

CI = 19.125 - 7.439 = 11.686
19.125 + 7.439 = 26.564
CI = (11.686, 26.564)

Interpr: 90% confident that the true mean studying time is between (11.686, 26.564)

f) How did you determine the correct procedure to use in part e)?

Chapter 7, I follow the steps
Condition, MOE, CI, Interpretation

g) Interpret the interval you calculated in part e).

We are 90% confident that the true mean study hours are between (11.686, 26.564) hours.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = x = 20$

$H_a = x < 20$

Student 19

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\frac{\Sigma x}{n} \rightarrow \frac{612}{32} = \boxed{19.1}$

b) Calculate the standard deviation.

$s = \sqrt{\frac{\Sigma x^2 - (\Sigma x)^2/n}{n-1}} \rightarrow s = \sqrt{\frac{13420 - (612)^2/32}{32-1}} = \boxed{7.4}$

c) What is the median of this dataset?

$\frac{20+19}{2} = \frac{39}{2} = \boxed{19.5}$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

they are statistics because they are from a sample, whereas parameters are for a population.

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

a. $n = 32$ ✓

b. $E = 1.645\left(\frac{7.4}{\sqrt{32}}\right) = 2.1519$

c. $19.1 \pm 2.1519 = (16.948, 21.2519)$

d. we are 90% confident the true mean amount is between 16.948 & 21.252.

f) How did you determine the correct procedure to use in part e)?

since the sample was ≥ 30 it was a large sample. I knew the z_c value for the margin of error & we calculated the sample standard deviation above. we also calculated the sample mean which we combined with the margin of error to get the 90% confidence interval.

g) Interpret the interval you calculated in part e).

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = \mu = 20$

$H_a = \mu < 20$

Student 20

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\bar{x} = \frac{5+6+11+12+12+12+13+14+14+15+15+16+18+18+18+19+20+20+20+20+20+21+21+21+22+25+26+27+28+31+32+40}{32} = 19.1$

b) Calculate the standard deviation.

x	$\bar{x}$	$x-\bar{x}$	$(x-\bar{x})^2$
5	19.1	-14.1	1.9
6		-13.1	2.9
11		-8.1	5.9
12		-7.1	6.9
12		-7.1	7.9
12		-7.1	8.9
13		-6.1	11.9
14		-5.1	12.9
14		-5.1	13.9
15		-4.1	20.9
15			
16			
18			
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26			
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28			
31			
32			
40			

$\sum (x-\bar{x})^2 = 1843.28$

$s = \sqrt{\frac{1843.28}{32-1}} = 7.52$

c) What is the median of this dataset?

$\frac{20+19}{2} = 19.5$

19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

These would be statistics because this is all data that's being calculated.

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$n = 1645\left(\frac{7.52}{\sqrt{32}}\right) = 2.1$

$19.1 + 2.1 = 21.2$ $\quad 19.1 - 2.1 = 17$

$\bar{x} \geq 30$

f) How did you determine the correct procedure to use in part e)?

$E = (17, 21.2)$

since σ is unknown, I used $z_c\left(\frac{s}{\sqrt{n}}\right)$

g) Interpret the interval you calculated in part e).

We are 90% students at WKU studied between 17 and 21.2 hours for finals.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = \mu = 19.1$ $\quad H_a = \mu < 20$

Student 21

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2025)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

$\mu = 19.125$

b. Calculate the standard deviation. *(1 point)*

$\sigma = 7.1439$

c. What is the median of this dataset? *(1 point)*

median = 19.5

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Statistic because it is for a sample :)

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

T stats

μ = 19.125

$s = 7.1439$

$n = 32$ random sample

σ : not known

L. Limit U. Limit

(16.0053, 21.3547)

f. How did you determine the correct procedure to use in part e? *(1 point)*

We know the standard deviation for the sample but not for the population. and

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean amount of time that WKU students spend studying for finals each semester is between 16.0053 and 21.3547 hours each semester.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0 = 20$ null

$H_a < 20$ alternative

p = population WKU students spend studying for finals ✓

Student 22

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2024)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

$\mu = 19.125$ hrs

b. Calculate the standard deviation. *(1 point)*

$s = 7.4390$ hrs

c. What is the median of this dataset? *(1 point)*

$\tilde{x} = 19.5$ hrs

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Statistics because these values are based off a summary of a sample not summary of a population.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

$\mu = 19.125$

$s = 7.4390$

$1 - \alpha = 0.90$

$CI \approx (16.8953, 21.3547)$ hrs

T stat calculator

stat crunch

f. How did you determine the correct procedure to use in part e? *(1 point)*

I determined the correct procedure by looking if the standard deviation was from a sample summary or population summary, and it was from a sample summary so I used t-stat.

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident when the true mean amount of time that WKU students spend studying for finals is between 16.8953 hours and 21.3547 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0: p = 20$ $H_1: p < 20$

Student 23

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2023)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

Summary Stats -

mean: 19.125

b. Calculate the standard deviation. *(1 point)*

std. dev. 7.4390

c. What is the median of this dataset? *(1 point)*

med: 19.5

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

statistics because they come from a sample of WKU students.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

$\bar{x}$: 19.125

$s_{\bar{x}}$: 7.4390 -T-stat (16.8953, 21.3547)

n: 32

$1-\alpha = 0.9$

f. How did you determine the correct procedure to use in part e? *(1 point)*

the values given were of a sample so a t-stat calculation was run

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean value for the number of hours spent studying for finals each semester of WKU students is between 16.8953 hours and 21.3547 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0: \mu = 20$ $H_a: \mu < 20$

Student 24

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2024)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

19.125

b. Calculate the standard deviation. *(1 point)*

7.4390

c. What is the median of this dataset? *(1 point)*

19.5

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Parameters, because we are taking the peoples hours studied

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

L. limit	Upper limit
16.9619	21.2881

f. How did you determine the correct procedure to use in part e? *(1 point)*

The interval was randomly selected, had the mean, population standard deviation, and a confidence iterval of $1-\alpha = .9$

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean amount of time a WKU student spends on studying is between 16.9619 and 21.281.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0 = .2$ and $H_1 = < 20$

Student 25

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2025)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

19.125

b. Calculate the standard deviation. *(1 point)*

7.438999

c. What is the median of this dataset? *(1 point)*

$(0.5)n = 16$ so:

19

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Statistics, because they portray data from a SAMPLE of WKU students, not the POPULATION of all WKU students

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

SC → Stat → T-Stats → One Sample → w/ Summ.

LOWER BOUND	UPPER BOUND
17.030212	21.21979

f. How did you determine the correct procedure to use in part e? *(1 point)*

Population SD was NOT known, so a z-test would not be appropiate. We DO have a sample SD, and so we can use a t-test.

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean value for amount of time WKU students spend studying on finals in a semester is between 17.030212 hours and 21.21979 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

NORM CALC:

$P(X \leq 20) = 0.54681$

Student 26

n = 32

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2023)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)* SC-SS

$\bar{x} = 19.1250$

b. Calculate the standard deviation. *(1 point)* SS

$s = 7.4390$

c. What is the median of this dataset? *(1 point)* SS

median = 19.5

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Statistics because they are part of a random sample

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

t-stat. $1-\alpha = 0.90$

$M_{\bar{x}} = 19.1250$

$s = 7.4390$

(16.8953, 21.3547)

f. How did you determine the correct procedure to use in part e? *(1 point)*

We were given standard deviation of the sample, so we needed to use t-stat.

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean amount of time WKU students spend studying for finals each semester is between 16.8953 hours and 21.3547 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$P(\bar{x} < 20) =$

$H_0 = 20 \quad H_a > 20$

Student 27

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2024)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

$\bar{x} = 19.125 = \bar{X}$ $\quad \bar{x} = \frac{\Sigma x}{n}$

b. Calculate the standard deviation. *(1 point)*

$s = 7.4390$ $\quad s^2 = \frac{\Sigma (x - \bar{x})^2}{n-1}$ $\quad s = \sqrt{s^2}$

c. What is the median of this dataset? *(1 point)*

med = 19.5 $\quad 19 + 20 \; \div \; 2 = 19.5$

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

statistics because we used a sample mean

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

$\bar{x} = 19.125$
$n = 32$
$s = 7.4390$
$1 - \alpha = .90$

(16.9629, 21.2891)

f. How did you determine the correct procedure to use in part e? *(1 point)*

I used a 2-stat because it was s not σ

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean amount of time that WKU students spend studying for finals each semester is between (16.9629, 21.2891)

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0 = \mu = 20$ $\quad H_a = \mu < 20$

Student 28

25. Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows (and as posted in the *Final Exam Data (183 Spring 2023)* dataset in the class group on StatCrunch): ***1, 3, N***

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

a. Calculate the mean. *(1 point)*

19.125

b. Calculate the standard deviation. *(1 point)*

7.4389992

c. What is the median of this dataset? *(1 point)*

19.5

d. Are the values calculated in parts a-c parameters or statistics? Why? *(2 points)*

Statistics because it was a random sample & not every WKU student

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester. *(3 points)*

$n = 44$ t interval (17.2397, 21.0103)

$\bar{x} = 19.125$

$s = 7.4389992$

$1-a = 0.9$

f. How did you determine the correct procedure to use in part e? *(1 point)*

I determined t interval because our random sample was ≥ 30 and σ was not known

g. Interpret the interval you calculated in part e. *(3 points)*

We are 90% confident that the true mean hours WKU students spend studying for finals each semester is between 17.2397 hours and 21.0103 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses? *(2 points)*

$H_0: \mu \geq 20$ $H_a: \mu < 20$

Student 29

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

$\bar{x} = 21.93$

B) Calculate the standard deviation.

$s = 7.6$

C) What is the median of this dataset?

20

D) Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because they are apart of a sample.

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

F) How did you determine the correct procedure to use in part e?

I didn't know σ, so I knew to use the TInterval command.

G) Interpret the interval you calculated in part e.

We are 90% confident that the true mean amount of time that WKU students spend studying for finals each semester is contained in the interval (16.895, 21.355).

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$ hrs

$H_1: \mu < 20$ hrs

Student 30

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean. $= 19.125$

B) Calculate the standard deviation.

C) What is the median of this dataset? 19.5

D) Are the values calculated in parts a-c parameters or statistics? Why?

Parameters b/c they are key components to finding the statistic

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

1PropZInt (.042164, .04857)

F) How did you determine the correct procedure to use in part e?

b/c there was a mean & you can use 1propzint to find the confidence interval

G) Interpret the interval you calculated in part e.

We are 90% confident that the true mean amount of time spent on studying for finals each semester lies between (.042164 & .04857)

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$ $H_1: \mu < 20$

Student 31

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.1

B) Calculate the standard deviation.

7.55

C) What is the median of this dataset?

19

D) Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because they were based on a set of data.

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

16.8, 21.329

F) How did you determine the correct procedure to use in part e?

I used Tinterval because the data was not based on proportions/percentages.

G) Interpret the interval you calculated in part e.

According to the interval, I am 90% confident the mean of 19.1 is included in the interval.

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

H_0 $M = 20$ H_1 $m < 20$

Student 32

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

~~5~~	~~6~~	~~11~~	~~12~~	~~12~~	~~12~~	~~13~~	14	~~14~~	~~15~~	~~15~~	~~16~~	~~18~~	~~18~~	~~18~~	~~19~~
~~20~~	~~20~~	~~20~~	~~20~~	~~20~~	~~21~~	~~21~~	~~21~~	~~22~~	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.1

B) Calculate the standard deviation.

7.4

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because they were recorded by a random sample of students

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(.04264 ~~%~~ .04857)

F) How did you determine the correct procedure to use in part e?

1-prop z int

G) Interpret the interval you calculated in part e.

One is confident that between (.04264, .04857) the mean of students who study is in this interval.

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: p = 20$
$H_1: p < 20$

$p = .2554$ $.2554 \leq .05$

insufficient evidence to support that students study less than 20 hours

Student 33

mean → z or T / σ not known

n=32

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

Data

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

L1

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.125

Stat
Calc
1-VarStats

B) Calculate the standard deviation.

s = 7.44

C) What is the median of this dataset?

med = 19.5

D) Are the values calculated in parts a-c parameters (population) or statistics (sample)? Why?

The values calculated in parts a-c are statistics because the data is from a sample, not from a whole population. Statistics go with samples

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

Stat
Tests
TInterval
=
(16.895, 21.355)

F) How did you determine the correct procedure to use in part e?

I determined that the problem referred to a mean rather than a proportion and that the test statistic is t rather than z because σ is not known. I then used TInterval to find the confidence interval.

G) Interpret the interval you calculated in part e.

One is 90% confident that the confidence interval (16.895, 21.355) actually contains the mean.

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$

$H_1: \mu < 20$

Student 34

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.125

B) Calculate the standard deviation.

7.439

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts a-c parameters or statistics? Why?

Statistic, because they are from a sample not a population.

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

F) How did you determine the correct procedure to use in part e?

As we are dealing with a sample, and mean (not having sigma) T-interval was the only option

G) Interpret the interval you calculated in part e.

We are 90% confident that the true mean of the amount of time wku students spent studying lies between the interval

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 20$ $H_A: \mu < 20$

Student 35

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

A) Calculate the mean.

19.125

B) Calculate the standard deviation.

7.439

C) What is the median of this dataset?

19.5

D) Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because they can be used to calculate intervals

E) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

F) How did you determine the correct procedure to use in part e?

I used the T Interval function because I did a T-test first, which I then used the stats to create an interval

G) Interpret the interval you calculated in part e.

90% of all WKU students study between 16.9 and 21.4 hours.

H) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 : M = 20$

$H_1 : M < 20$

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

32

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean. 612 / 32
= 19.125

b. Calculate the standard deviation.
7.44

c. What is the median of this dataset?
19.5

d. Are the values calculated in parts a-c parameters or statistics? Why?
Statistic because there were exactly 32 students responses at 1 certain school.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.
(18, 31)

f. How did you determine the correct procedure to use in part e?
I am not very sure, I just did some calculations and that's what I came up with

g. Interpret the interval you calculated in part e.
90% confident that the majority of students at WKU study for finals each semester on average is 18 to 31 hrs

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is ~~less than 20 hours~~. What would be the appropriate hypotheses?
$H_0 = 20$ hrs
$H_1 < 20$ hrs

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean.

$(5+6+11+12+12+12+13+14+14+15+15+16+18+18+18+19+20+20+20+20+20+21+21+21+22+25+26+27+28+31+32+40)/32$

$\bar{x} = 19.125$

b. Calculate the standard deviation.

$\sigma = \sqrt{\frac{\sum(\bar{x}-x)^2}{n}} \approx 7.3218$ 42323

c. What is the median of this dataset?

$(19+20)/2 = 19.5$

d. Are the values calculated in parts a-c parameters or statistics? Why?

They are parameters because they are of a sample.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

~ (16.996, 21.254)

Z Interval
σ : 7.3218
$\bar{x}$: 19.125
n : 32
C-Level : 0.9

f. How did you determine the correct procedure to use in part e?

The sample size is greater than 30, so we can use population standard deviation & therefore use a Z-interval test.

g. Interpret the interval you calculated in part e.

We are 90% confident that the true mean value of hours WKU students spend studying for finals each semester is between 16.996 & 21.254.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

The true mean time WKU students spend studying for finals each semester is less than 20 hours.

$H_A: \mu < 20$ hours

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean.

$\frac{612}{32} = 19.125$

b. Calculate the standard deviation.

4.373

c. What is the median of this dataset?

$\frac{19+20}{2} = 19.5$

d. Are the values calculated in parts a-c parameters or statistics? Why?

Statistics because it is only part of the population.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$\mu = 19.125 \quad \sigma = 4.373 \quad n = 32.$

$z_{0.05} = 1.645$

$1.645\left(\frac{4.373}{\sqrt{32}}\right) = 1.272$

$19.125 - 1.272 = 17.853$

$19.125 + 1.272 = 20.396$

$(17.853, 20.396)$

f. How did you determine the correct procedure to use in part e?

Because I had a mean and standard deviation I could use the formula $z = \frac{\sigma}{\sqrt{n}}$ and use my answer from there to add + subtract to find my L.B. + U.B.

g. Interpret the interval you calculated in part e.

of the 32 WKU students we are 90% confident students study an average 17.853 hrs/20.396 hrs. for finals

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = 20$ hours

$H_1 < 20$ hours

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean.

19.125

b. Calculate the standard deviation.

35

c. What is the median of this dataset?

19

d. Are the values calculated in parts a-c parameters or statistics? Why?

C- parameters because it couldn't be a statistic in this data set. It's coming from a sample of a population.

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

f. How did you determine the correct procedure to use in part e?

g. Interpret the interval you calculated in part e.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean. 19.125

b. Calculate the standard deviation. $Sx \approx 7.4390$

c. What is the median of this dataset? 19.5

d. Are the values calculated in parts a-c parameters or statistics? Why?

These are all statistics because the data is from a sample not a population

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.895, 21.355)

f. How did you determine the correct procedure to use in part e?

T-interval because I am not using the population standard deviation. I am using the sample standard deviation

g. Interpret the interval you calculated in part e.

I am 90% confident that out of all WKU students they have studied for finals between 16.895 and 21.355 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu_x = 20$

$H_a: \mu_x < 20$

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5	6	11	12	12	12	13	14	14	15	15	16	18	18	18	19
20	20	20	20	20	21	21	21	22	25	26	27	28	31	32	40

Note that $\sum x = 612$ and $\sum x^2 = 13420$.

a. Calculate the mean.

19.125 σ 7.3218

b. Calculate the standard deviation.

7.43810

c. What is the median of this dataset?

19.5

d. Are the values calculated in parts a-c parameters or statistics? Why?

Stanstic, the study has already been done

e. Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

(16.996, 21.254)

f. How did you determine the correct procedure to use in part e?

I was given all the data to correctly do a z interval

g. Interpret the interval you calculated in part e.

We are 90% confident that the true mean time that WKU Students Spend studying for finals each semester is between 16.996 and 21.254 hours.

h. Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

Fail to reject the null hypothesis. At the .5 significance level, the data do not provide sufficient evidence to conclude that WKU students Spend studying for finals is less than 20 hrs.

Student 42

Mean = 62,345 mean should be lower
n = 43 σ = 5,936 α = 0.01 ± 59,983

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$= \frac{612}{32} = 19.125$

b) Calculate the standard deviation.

$s = \sqrt{\frac{\sum (x-\mu)^2}{n}} = \sqrt{\frac{(612 - 19.125)^2}{32}} = 104.82$

c) What is the median of this dataset?

$\frac{19+20}{2} = 19.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Statistic, this is a measurement of the same property of a sample

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$C = .90 \quad \bar{x} = 19.125$

$E = z_{.90} \frac{s}{\sqrt{n}} = 1910 \times \frac{104.82}{\sqrt{32}} = 35391.8$

$\bar{x} - E = 19.125 - 35392 =$

$\bar{x} + E = 19.125 + 35392 =$

f) How did you determine the correct procedure to use in part e)?

I looked through my notes and noticed I would need to find the Margin of error before I could find the confidence Interval.

g) Interpret the interval you calculated in part e).

We are 90% confident

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 : \mu = 20$

$H_A : \mu < 20$

Student 43

Suppose that 32 WKU students are randomly selected and asked, ··How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean. all numbers divided by 32

18.5

b) Calculate the standard deviation.

$$\sqrt{\frac{13420 - \frac{612^2}{32}}{32-1}} = 41.04$$

c) What is the median of this dataset?

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19 20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

$\frac{18+19}{2} = 18.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

statistic because it is a sample from population

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$z_{.90}$ $\frac{1+.90}{2}, 0, 1$ $= 1.645$

f) How did you determine the correct procedure to use in part e)?

I used invNorm. area = (14.9) 12)
$\mu = 0$
$\sigma = 1$

g) Interpret the interval you calculated in part e).

this determines it to be close to the confidence rate

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

WKU students study for less than 20 hours for finals

Student 44

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$612/32 = 19.125$

b) Calculate the standard deviation.

$SD = \sqrt{13420} = 115.84$

c) What is the median of this dataset?

$\frac{19+20}{2} = 19.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Parameters because it shows individual score for every student

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$z_{.90} = 1.645$

$z_{.90} = E = z_{0.90} \frac{s}{\sqrt{n}} = 1.645 \times \frac{19.125}{\sqrt{32}} = 5.56$

f) How did you determine the correct procedure to use in part e)?

I determine this procedure because it asked for confidence interval for true mean amount time.

g) Interpret the interval you calculated in part e).

$\bar{x} - E = 20 - 5.56 = 14.44$

$\bar{x} + E = 20 + 5.56 = 25.56$

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = 20$, $H_a < 20$

Student 45

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\frac{612}{32} = 19.1$

b) Calculate the standard deviation.

$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}} = s = \sqrt{\frac{13,420}{32-1}} = 432.9$

c) What is the median of this dataset?

$\frac{19 + 20}{2} = 19.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

they are parameters because the data is known of population

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$n = \frac{z_c \sigma}{E} = \frac{0.90 \times 19.1}{1.645} = 10.44$

f) How did you determine the correct procedure to use in part e)?

I am aware of how to find confidence intervals to calculate my assignment

g) Interpret the interval you calculated in part e).

we can be 90% confident that the true mean amount of time will fall between 10 and 50's of the mean.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = U = 20$ hours

$H_a = U < 20$

Student 46

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

612/32 = 19.125 or 19.13

b) Calculate the standard deviation.

$\sqrt{\frac{13420}{32}} = 20.47$

c) What is the median of this dataset?

20+19 = 39/2 = 19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Statistic because it is based on data/numbers collected

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$\bar{X} \pm Z_{\alpha/2} \frac{s}{\sqrt{n}}$

Sample mean : 17.375

Standard deviation ≈ 20.47

Sample size : 32

90% of the confidence interval 151.645

f) How did you determine the correct procedure to use in part e)?

it represents the range of values used to determine the amount of study hours

Switch answers I put them in the wrong spot

g) Interpret the interval you calculated in part e).

based on standard method for constructing confidence levels using the sample mean

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

alternative hypothesis

- the true mean amount of time spent on studying for finals is less than 20 ($\mu < 20$)

Student 47

write answer on page

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

8 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

a) Calculate the mean.

$\frac{612}{32} = 19.1$

b) Calculate the standard deviation.

$s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\frac{(612)^2 - 364.81}{32-1}} = 2.8 \approx 3$

c) What is the median of this dataset?

19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Statistics, asking for mean weight

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

90% CL SS = 32 SD = 2.8

$n = \left(\frac{Z_{.90} s^2}{E}\right) = \left(\frac{1.645 \times 2.8}{2}\right)^2 = 20$ hrs

f) How did you determine the correct procedure to use in part e)?

you have to know whether it's a statistic or parameter, then you have to use steps from a to b to know standard deviation and mean.

g) Interpret the interval you calculated in part e).

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0 = 20$ hrs

$H_a = \mu < 20$ hrs

Student 48

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

$\frac{19+20}{2} = 19.5$

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

Cate.	f	X	XF	X^2f
1-10	2	5.5	11	60.5
11-20	19	15.5	294.5	4564.75
21-30	8	25.5	204	5202
31-40	3	35.5	106.5	3780.75
	32		616	$X^2f = 13608$

$n =$

a) Calculate the mean.

$\bar{X} = \frac{\Sigma xf}{\Sigma f} = \frac{616}{32} = 19.25$

b) Calculate the standard deviation.

$\sigma = \sqrt{\frac{n(\Sigma x^2 f) - (\Sigma xf)^2}{n(n-1)}} = \sqrt{\frac{32(13608) - (616)^2}{32(32-1)}} = 260.495$

c) What is the median of this dataset?

$\frac{19+20}{2} = 19.5$

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Statistics b/c they are numerical measurements based on a sample

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

1. sample size is 32 (>30) and random
2. $1.645 \frac{260.495}{32} = 13.391$
3. $19.25 + 13.391 = 32.641$ $19.25 - 13.391 = 5.859$
4. We are 90% confident that WKU students study between 5.86 and 32.64 hours.

f) How did you determine the correct procedure to use in part e)?

I used my standard deviation from part B to calculate the margain of error and then I used my $\bar{X} = 19.25$ as $\bar{X}$ for the confidence intervals.

g) Interpret the interval you calculated in part e).

We are 90% confident that WKU students study between 5.86 and 32.64 hours for finals each semester.

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

H_0: $\bar{X} = 20$ hours

H_a: $\bar{X} < 20$ hours

Student 49

Suppose that 32 WKU students are randomly selected and asked, "How many hours do you spend studying for finals each semester?" The results are as follows:

5 6 11 12 12 12 13 14 14 15 15 16 18 18 18 19

20 20 20 20 20 21 21 21 22 25 26 27 28 31 32 40

Note that $\sum x = 612$, and $\sum x^2 = 13420$.

	f
5-11	8
12-18	12
19-25	11
26-40	6

a) Calculate the mean.

612/32 = 19.125

b) Calculate the standard deviation.

	f	midpoint = x	x(f)	$x^2 f$
5-11	8	(5+11)/2 = 8	8(3) = 24	$(8^2)3 = 192$
12-18	12	(12+18)/2 = 15	15(12) = 180	$(15^2)12 = 2700$
19-25	11	(19+25)/2 = 22	22(11) = 242	$(22^2)11 = 5324$
26-40	6	(26+40)/2 = 33	33(6) = 198	$(33^2)6 = 6534$
	Total: 32		Total: 644	Total: 14750

$$S = \sqrt{\frac{(32)14750 - (644^2)}{32(32-1)}}$$

S = 14047.6

c) What is the median of this dataset?

19+20/2 = 19.5

d) Are the values calculated in parts a)-c) parameters or statistics? Why?

Parameters because they are numerical measurements about some property of this sample.

e) Calculate a 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester.

$z_{0.90} = 1.645 \times \frac{14047.6}{\sqrt{32}} = 4085.01$

$\bar{x} \pm E = 19.125 \pm 4085.01 = 4104.14$

$CI = \bar{x} - E = 19.125 - 4085.01 = -4065.89$

(-4065.89, 4104.14)

f) How did you determine the correct procedure to use in part e)?

By finding the margin of error and then using the confidence interval to find those amounts.

g) Interpret the interval you calculated in part e).

In part e I found the 90% confidence interval for the true mean amount of time that WKU students spend studying for finals each semester, therefore the confidence interval is (-4065.89, 4104.14)

h) Suppose you wanted to test if the true mean amount of time that WKU students spend studying for finals each semester is less than 20 hours. What would be the appropriate hypotheses?

$H_0: \mu = 19.125$ $H_a: < 20$ left tailed test