Quiz Monday

Standard Deviation (552 & 553)

Review 1

The height of high school seniors in the U.S. in normally distributed with a mean of 66 inches and a standard deviation of 2.3 inches.

Round your answer to four significant figures.

1. 80% of all high school seniors are taller than what height?

   64.06 inches

2. 5% of all high school seniors are shorter than what height?

   62.22 inches

3. Centered at the mean, 94% of all seniors are between what two lengths?

   61.67 & 70.33 inches

Review 2

In a random sample of 450 teachers in Virginia, 175 have their Masters Degree. Set up a 90% confidence interval to find p, the population parameter for the # of teachers in VA with a Master's degree.

Round your answer to four significant figures.

1. Describe the population you are interested in.
2. Find the point estimate.
3. Find the critical value (Z).
4. Find E, the margin of error.
5. What is the 90% confidence interval?
6. Interpret the results of (5) in words.

Lesson 17

Confidence Intervals (Part 2 of 3):
Large Sample ($n \geq 30$)

Notation

Population (Parameters):

- Mean:

μ

- Standard Deviation:

σ

Sample (Statistics):

- Mean:

$\bar{x}$

- Standard Deviation:

s

Which are we interested in?

Find a 98% confidence interval for the mean number of games that seniors at Salem High School attended over the first five games.

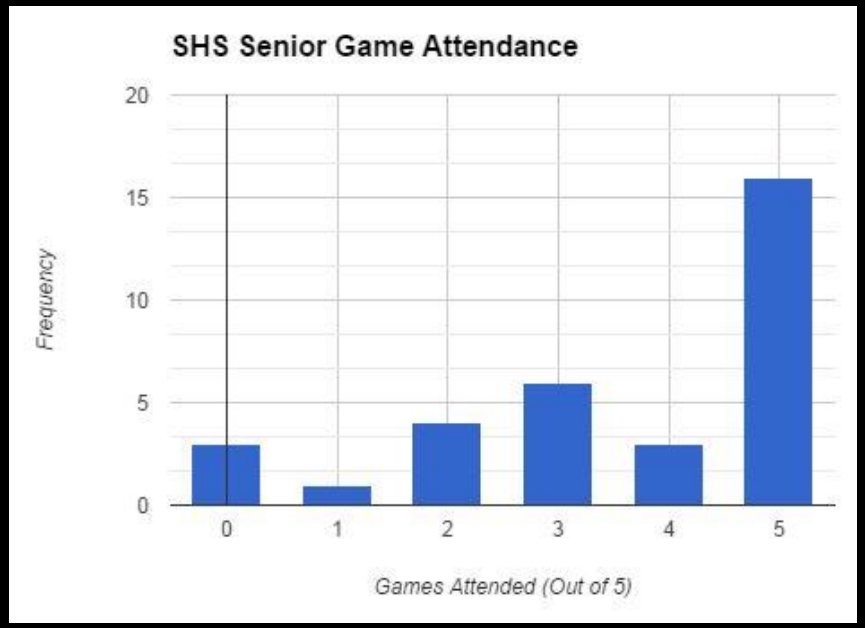
TASK

Step 1

Find the Point Estimate

Senior Attendance at Football Games

Games Attended	Frequency
0	3
1	1
2	4
3	6
4	3
5	16
Total:	**33**



Find the mean: $\bar{x} = 3.61$

And <u>sample</u> standard deviation (s_x): $s = 1.68$

Step 2

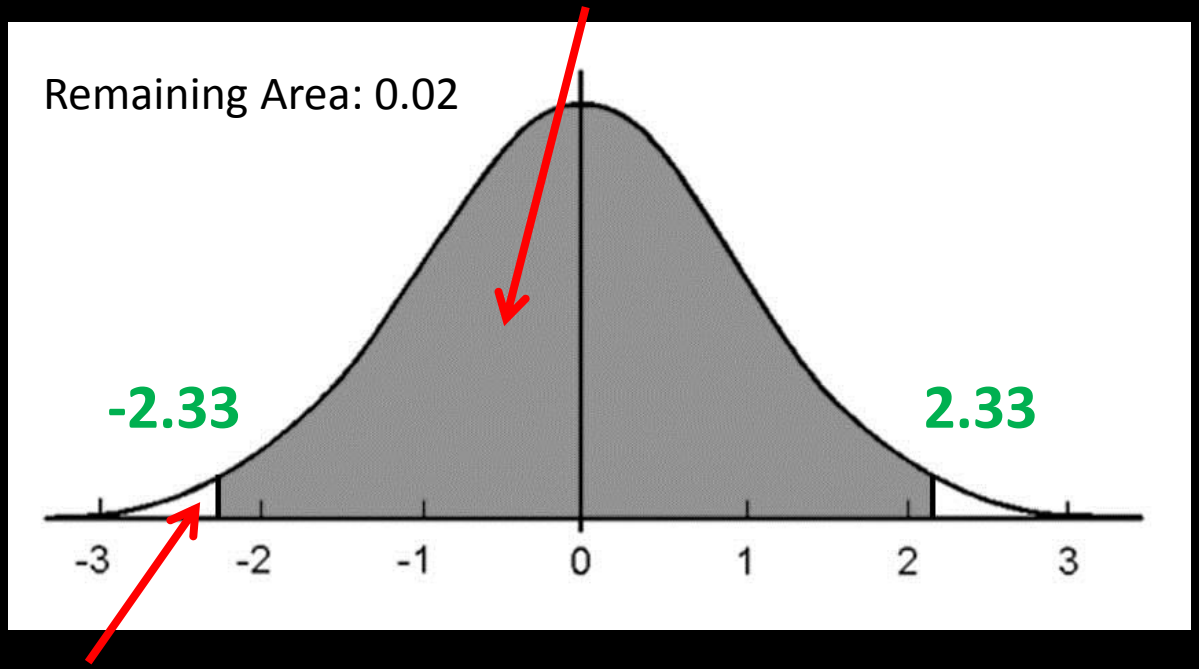
Find the Critical Value

(Large sample, 98% level of confidence)

Finding the Critical Value Z_{98}

Round to three sig figs

We want this area to be 0.98.



This means that each tail has 0.02/2 = 0.01.

$$Z_{98} = 2.33$$

Step 3

Find the Margin of Error

Step 3: Find the Margin of Error (E)

- Formula for E:

$$E = Z_c \frac{s}{\sqrt{n}}$$

$$E = 2.33 \cdot \frac{1.68}{\sqrt{33}}$$

$$E = 0.681$$

$$n = 33$$

$$\bar{x} = 3.61$$

$$s = 1.68$$

$$Z_{98} = 2.33$$

Step 4

Set up the Confidence Interval

Confidence Interval

$$\bar{x} - E < \mu < \bar{x} + E$$

$$3.61 - 0.681 < \mu < 3.61 + 0.681$$

$$2.93 < \mu < 4.29$$

Interpretation

- 98% of similarly set up samples will contain the parameter μ.

- μ is the true mean number of games that SHS seniors have attended through the first five games.


J