

Analyzing Steelers' Performance in 2009 Using New TI-Nspire with OS 2.0

ALEGRA II
PRE CALCULUS
STATISTICS

TN CLE 3103.5.1 CFU 3103.5.5 Calculate measures of central tendency & Spread

Activity: Analysis of the 2008 Super Bowl Champs: Pittsburgh Steelers

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Open the SuperBowl Champs 2008.tns document

Insert the points scored per game in column A Type "points" in the title row of column A The points scored is automatically inserted.	1.1 SuperBowl ...08A			
	points	B	C	D
	1			
	2			
	3			
	4			
5				
	A	points		

Add a Data & Statistics Page

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5: Add Data & Statistics

Make a Dot Plot

Move cursor to bottom center until cursor changes to crosshairs

.

Select "points"

Describe the Dot Plot _____

Make a Box Plot

b

1: Plot Type

2: Box Plot

Is the Box Plot approximately symmetrical? _____

What is the MEDIAN? _____

What can we tell about the MEAN? _____

How do we know that? _____

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Go back to the Data Page (/ then press left on touchpad)

Insert a Column BEFORE "points" column.

Move the cursor up until the entire column is highlighted.

b

2: Insert

3: Insert Column



Name the column "game"

Fill in the column with numbers from 1 to 19

Go to the Statistics Page (/ then press right on touchpad)

Change the x axis to game

Make the y axis points

Find the line of Best Fit.

What is another name for this line? _____

What is the equation of this line? _____

Did the Steelers scoring increase or decrease over time? _____

Over all, how much did the scoring change per game? _____

What does the constant mean? _____

Does this really make sense? _____ Why or why not _____.

We want to determine the variability of the Steelers scoring.

Go to the Data Page

Name Column C "resids"

Calculate the difference between the points per game and the mean

What do you think that will look like? _____

Go to the Statistics Page

Add a Residual graph

b

4: Analyze

7: Residuals

2: Show Residual Plot

Describe do you see? _____

What does this mean? _____

What is the sum of the residuals? _____ Why? _____

What would happen if we squared the residuals?

Go to Data Page

Name Column D "squares"

Enter the square for the residuals

HINT: In the grey box type =resids q.

What does squares of the residuals look like? _____.

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Go to the Statistics Page

Add a Residual graph

b

4: Analyze

7: Residuals

1: Show Residual squares

Describe do you see? _____

What does this mean? _____

Will the sum of the squares also equal zero? Why(not) _____.

What will the sum of the square of residuals be??

Add a Calculator Page

/

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1: Add Calculator ·

Type sum(square)

Record your answer _____.

What would make the answer smaller? _____

What would make the answer larger? _____

Do we want the sum of the squares to be large or small and why? _____

_____.

Simply adding more points will increase the sum of the squares.

How can we determine the average variability? _____.

For census data (the whole population) we divide by n

For sample data(a proportion) n - 1

Let's use n-1 as we are using this year to make inference about all of the Steeler's Super Bowl years.

What is the Variance? _____

How did we overcome getting zero by adding the residuals? _____

To find the standard deviation, we need to "undo" the squaring, so take the square root of the previous answer. _____

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In the 2008 Super Bowl, Cardinals by scored 23 points. Based on their history, what was the probability the Steelers will score 24 or more points in their next Super Bowl?

Conditions:

1. σ is unknown.
2. SRS assumed.
3. No extreme outlier (from box plot.)
4. Normally distributed, verified (not required.)

Identify the population of interest _____.

Parameter _____.

Null and Alternative Hypothesis

H_0 _____

H_a _____

Inference Procedure _____.

Set up formula to find $P(v)$

$df =$ _____

$t =$ _____

$P(x) =$ _____

Conclusion: Make the connection to the population of interest in context.