

Chapter 14 / Example 7

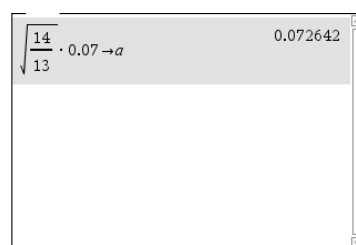
The t -test

- a** In order to test the hypotheses $H_0: \mu = 8.2$, $H_1: \mu < 8.2$ a sample of 14 is taken and the mean of the sample is found to be 8.15 and the standard deviation 0.07. Test at the 5% significance level whether the sample is from the population given or one with a smaller mean.
- b** The sample below is thought to have come from a normal population with a mean of 34.5. Test this belief at a 5% significance level.

34.3	30.2	29.7	34.4	33.6	35.7	34.0	33.9	35.1	34.5
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Calculate $s_{n-1} = \sqrt{\frac{n}{n-1}} s_n = \sqrt{\frac{14}{13}} \times 0.07 = 0.0726$ and store this value as A by pressing $\boxed{\text{ctrl}} \boxed{\text{var}} \boxed{\text{sto} \rightarrow}$ and typing A.

Press $\boxed{\text{enter}}$.

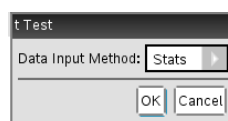


$H_0: \mu = 8.2$, $H_1: \mu < 8.2$

To calculate the p -value press $\boxed{\text{menu}} \boxed{6:\text{Statistics}} \boxed{7:\text{Stat Tests}} \boxed{2:t \text{ Test} \dots}$

Choose Input Method: Stats

Press $\boxed{\text{enter}}$.



$\mu_0 = 8.2$

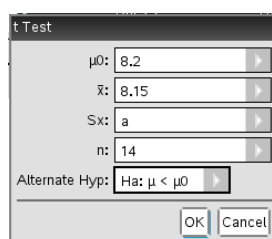
$\bar{x} = 8.15$

$Sx = A$

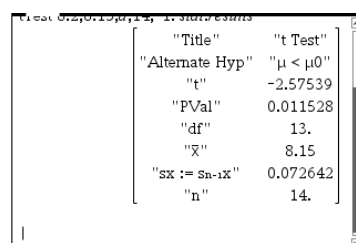
$n = 14$

$H_a: \mu < \mu_0$

Press $\boxed{\text{enter}}$.



p -value = 0.0115 < 0.05, significant so reject $H_0: \mu = 8.2$



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The t -test

Add a new Lists & Spreadsheet page to your document by pressing **ctrl** **doc** **(+page)** 4: Add Lists & Spreadsheet

Type 'x' in the first cell.

Enter the x-coordinates of the three points in the first column.

Press **enter** or **▼** after each number to move to the next cell.

	A x	B	C	D
1	34.3			
2	30.2			
3	29.7			
4	34.4			
5	33.6			

$H_0: \mu = 34.5$, $H_1: \mu \neq 34.5$

To calculate the p -value press **menu** 4: Statistics | 4: Stat Tests | 2: t Test...

Choose Input Method: Data

Press **enter**.

t Test

Data Input Method: Data

OK Cancel

$\mu_0 = 34.5$

List: x

Frequency List: 1

$\mu \neq \mu_0$

Press **enter**.

t Test

μ_0 : 34.5

List: x

Frequency List: 1

Alternate Hyp: $H_a: \mu \neq \mu_0$

1st Result Column: b[]

Draw: ☐ Shade P Value

OK Cancel

p -value = 0.161 > 0.05, not significant so insufficient evidence to reject H_0

	A x	B	C	D
			=tTest(34.	
1	34.3	Title	t Test	
2	30.2	Alternate...	$\mu \neq \mu_0$	
3	29.7	t	-1.52674	
4	34.4	PVal	0.161171	
5	33.6	df	9.	