




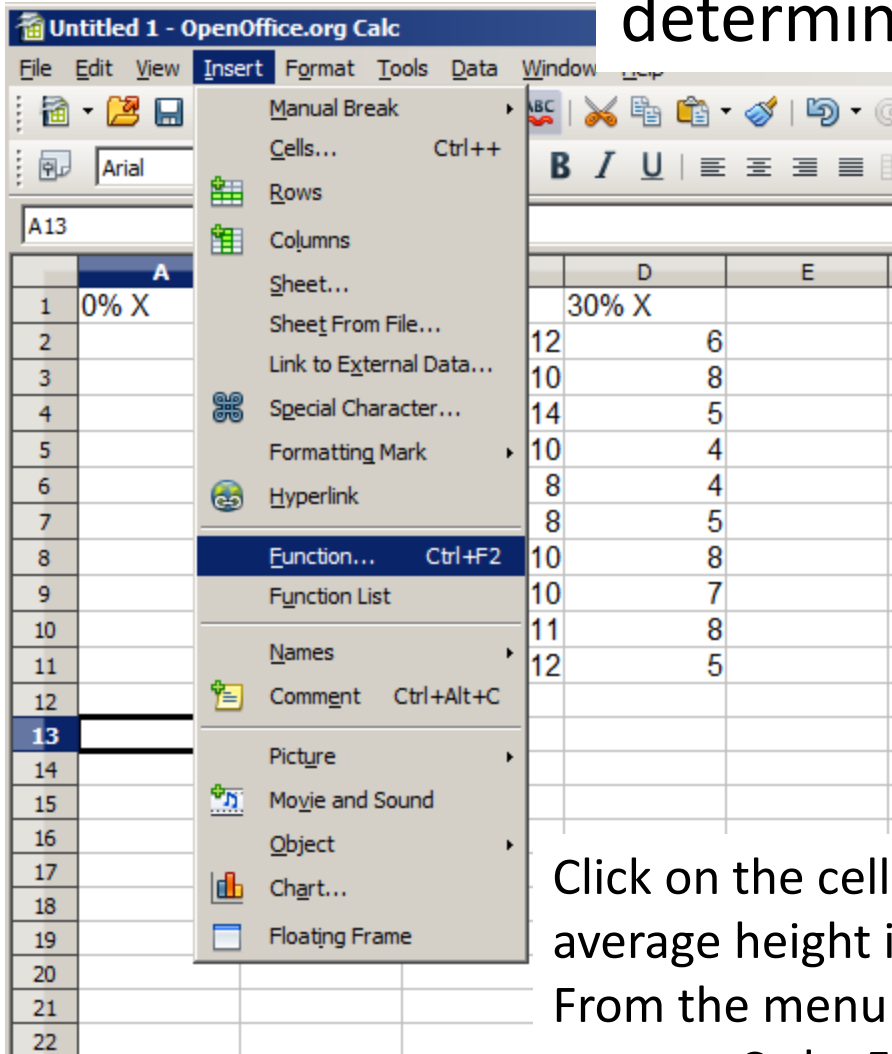


Untitled 1 - OpenOffice.org Calc												
File Edit View Insert Format Tools Data Window Help												
												
Arial 11 B I U   												
W41  =												
	A	B	C	D	E	F	G	H	I	J	K	L
1	0% X	10% X	20% X	30% X								
2	15	18	12	6								
3	14	20	10	8								
4	13	14	14	5								
5	15	20	10	4								
6	15	18	8	4								
7	17	19	8	5								
8	18	18	10	8								
9	12	18	10	7								
10	19	17	11	8								
11	15	19	12	5								
12												
13												
14												
15												
16												
17												

Open Office spreadsheet with Mary's tomato plant data

determining mean in Open Office



Click on the cell where you want to put the average height in the 0% X group.

From the menu bar, select Insert --> Function or press Ctrl + F2.

	A	B	C	D	E	F	G	H	I	J	K	L
1	0% X	10% X	20% X	30% X								
2	15	18	12	6								
3	14	20	10	8								
4	13	14	14	5								
5	15	20	10	4								
6	15	18	8	4								
7	17	19	8	5								
8	18	18	10	8								
9	12	18	10	7								
10	19	17	11	8								
11	15	19	12	5								
12												
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16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												

Function Wizard

Functions

Category

Statistical

Function

AVEDEV
AVERAGE
AVERAGEA
B
BETADIST
BETAINV
BINOMDIST
CHIDIST
CHIINV
CHISQDIST
CHISQINV
CHITEST
CONFIDENCE
CORREL
COUNT

☐ Array

Help

Cancel

<< Back

Next >>

OK

Function result

AVERAGE
AVERAGE(number 1; number 2; ...)

Returns the average of a sample.

Formula

=

Result

Err:520

You'll get a dialog box. Select Statistical from the pull down menu for Category. Then select AVERAGE from the Function list.

Click Next>>

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	0% X	10% X	20% X	30% X									
2	15	18	12	6									
3	14	20	10	8									
4	13	14	14	5									
5	15	20	10	4									
6	15	18	8	4									
7	17	19	8	5									
8	18	18	10	8									
9	12	18	10	7									
10	19	17	11	8									
11	15	19	12	5									
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													

Functions

Structure

Category

Statistical

Function

AVERAGE

AVERAGEA

B

BETADIST

BETAINV

BINOMDIST

CHIDIST

CHIINV

CHISQDIST

CHISQINV

CHITEST

CONFIDENCE

CORREL

COUNT

COUNTA

Array

AVERAGE

Function result

15.3

Returns the average of a sample.

number 1 (required)

Number 1, number 2;...are 1 to 30 numeric arguments representing a population sample.

number 1

fx

A2:A11

number 2

fx

number 3

fx

number 4

fx

Formula

Result

15.3

=AVERAGE(A2:A11)

Help

Cancel

<< Back

Next >>

OK

Enter the range of cells to be averaged in the number 1 box. You can either type the cell numbers in the box or highlight the column of cells. Click OK.

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Arial 11 B I U

A13 \sum = `=AVERAGE(A2:A11)`

	A	B	C	D	E
1	0% X	10% X	20% X	30% X	
2	15	18	12	6	
3	14	20	10	8	
4	13	14	14	5	
5	15	20	10	4	
6	15	18	8	4	
7	17	19	8	5	
8	18	18	10	8	
9	12	18	10	7	
10	19	17	11	8	
11	15	19	12	5	
12					
13	15.3				
14					
15					
16					
17					
18					

The mean plant height for the plants in the 0% X group now appears in cell A13. Repeat the steps to get the means for the 10%, 20%, and 30% groups.

Standard Deviation

The image shows an Excel spreadsheet with data in columns A through D. Column A is labeled '0% X', B '10% X', C '20% X', and D '30% X'. Rows 2 through 11 contain numerical data. Row 13 shows the mean for each column: 15.3, 18.1, 10.5, and 6. Row 14 is currently selected, and the formula bar shows '=STDEV(A2:A11)'. The Function Wizard dialog box is open, showing the 'STDEV' function selected from the 'Statistical' category. The function result is 2.162817093. The formula bar also displays '=STDEV(A2:A11)'.

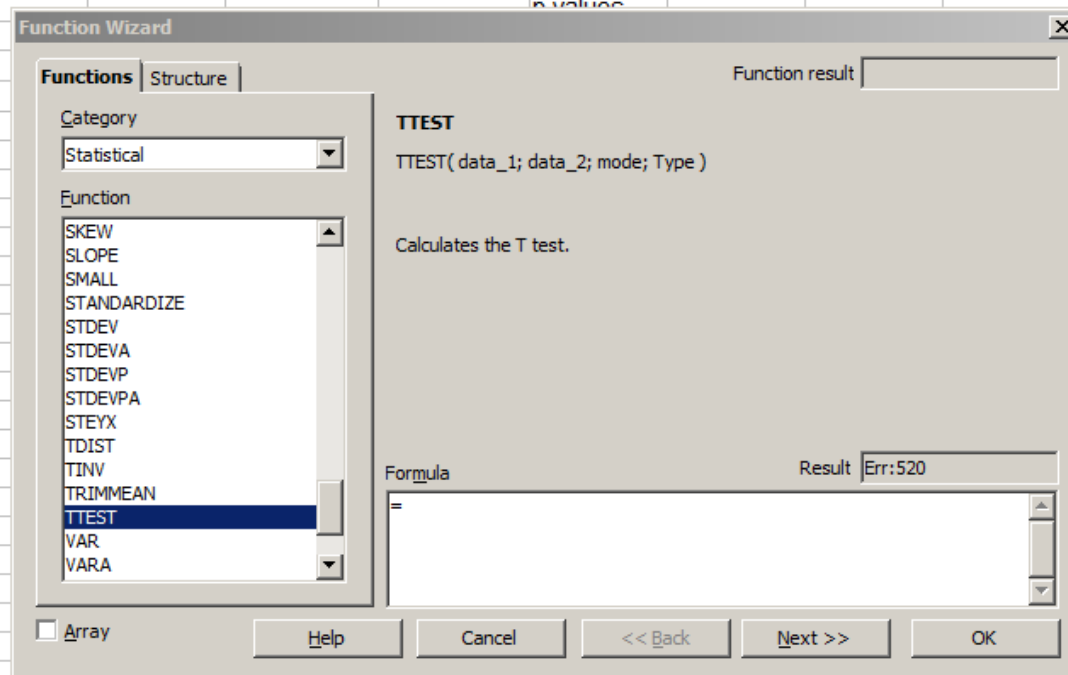
	A	B	C	D
1	0% X	10% X	20% X	30% X
2	15	18	12	6
3	14	20	10	8
4	13	14	14	5
5	15	20	10	4
6	15	18	8	4
7	17	19	8	5
8	18	18	10	8
9	12	18	10	7
10	19	17	11	8
11	15	19	12	5
12				
13	15.3	18.1	10.5	6 mean
14				std dev
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

The steps for determining the standard deviation for each group are essentially the same as for determining the mean. The exception is that you select STDEV from the Function list.

	A	B	C	D	E	F	G	H
1	0% X	10% X	20% X	30% X				
2	15	18	12	6				
3	14	20	10	8				
4	13	14	14	5				
5	15	20	10	4				
6	15	18	8	4				
7	17	19	8	5				
8	18	18	10	8				
9	12	18	10	7				
10	19	17	11	8				
11	15	19	12	5				
12								
13	15.3	18.1	10.5	6	mean			
14	2.16281709	1.72884033	1.840893503	1.632993162	std dev			
15								
16		0% vs 10%	0% vs 20%	0% vs 30%	t test			
17					p values			
18								
19			10% vs 20%	10% vs 30%	t test			
20					p values			

t test

For the t test to compare two means, select TTEST from the Function list. Click Next>>.



11

B17

=TTEST(A2:A11;B2:B11)

	A	B	C	D	E	F	G	H
1	0% X	10% X	20% X	30% X				
2		15	18	12				
3		14	20	10				
4		13	14	14				
5		15	20	10				
6		15	18	8				
7		17	19	8				
8		18	18	10				
9		12	18	10				
10		19	17	11				
11		15	19	12				
12								
13	15.3	18.1	10.5	6 mean				
14	2.16281709	1.72884033	1.840893503	1.632993162 std dev				
15								
16		0% vs 10%	0% vs 20%	0% vs 30%	t test			
17					p values			
18								
19			10% vs 20%	10% vs 30%	t test			
20					p values			

You'll get a more complicated looking dialog box this time. Enter the cells for one of the data groups to be compared in data_1. Enter the cells for the other data group in data_2.

Function Wizard

Functions | Structure

Category: Statistical

Function: TTEST

Function result: Err:511

Calculates the T test.

data_2 (required)
The second record array.

data_1: A2:A11

data_2: B2:B11

mode:

Type:

Formula: =TTEST(A2:A11;B2:B11)

Result: Err:511

Array

Help Cancel << Back Next >> OK

B17 fx Σ = =TTEST(A2:A11;B2:B11;2;3)

	A	B	C	D	E	F	G	H
1	0% X	10% X	20% X	30% X				
2	15	18	12	6				
3	14	20	10	8				
4	13	14	14	5				
5	15	20	10					
6	15	18	8					
7	17	19	8					
8	18	18	10					
9	12	18	10					
10	19	17	11					
11	15	19	12					
12								
13	15.3	18.1	10.5	6	mean			
14	2.16281709	1.72884033	1.840893503	1.632993162	std dev			
15								
16		0% vs 10%	0% vs 20%	0% vs 30%	t test			
17					p values			
18								
19			10% vs 20%	10% vs 30%	t test			
20					p values			

Function Wizard

Functions Structure

Category: Statistical

Function: TTEST

Function result: 0.0052215534

Calculates the T test.

Type (required)
The type of the T test.

data_1: A2:A11

data_2: B2:B11

mode: 2

Type: 3

Formula: =TTEST(A2:A11;B2:B11;2;3)

Result: 0.0052215534

Array: ☐

Help Cancel << Back Next >> OK

For a two-tailed t test with unequal variances, the mode is 2 and the Type is 3. Click OK.

C17								
	A	B	C	D	E	F	G	H
1	0% X	10% X	20% X	30% X				
2	15	18	12	6				
3	14	20	10	8				
4	13	14	14	5				
5	15	20	10	4				
6	15	18	8	4				
7	17	19	8	5				
8	18	18	10	8				
9	12	18	10	7				
10	19	17	11	8				
11	15	19	12	5				
12								
13	15.3	18.1	10.5	6 mean				
14	2.16281709	1.72884033	1.840893503	1.632993162 std dev				
15								
16		0% vs 10%	0% vs 20%	0% vs 30%	t test			
17		0.00522155			p values			
18								
19			10% vs 20%	10% vs 30%	t test			
20								

Repeat the t test for the other data pairs.

Function Wizard

Functions

Structure

Category

Statistical

Function

STDEV

STDEVA

STDEVP

STDEVPA

STEYX

TDIST

TINV

TRIMMEAN

TTEST

VAR

VARA

VARP

VARPA

WEIBULL

ZTEST

TTEST

Function result

4.82213170032573E-01

Calculates the T test.

Type (required)

The type of the T test.

data_1

fx

A2:A11

data_2

fx

C2:C11

mode

fx

2

Type

fx

3

Formula

Result

4.82213170032573E-01

=TTEST(A2:A11;C2:C11;2;3)

Array

Help

Cancel

<< Back

Next >>

OK

Mary.ods - OpenOffice.org Calc					
File Edit View Insert Format Tools Data Window Help					
Arial 11 B I U					
M31					
	A	B	C	D	E
1	0% X	10% X	20% X	30% X	
2	15	18	12	6	
3	14	20	10	8	
4	13	14	14	5	
5	15	20	10	4	
6	15	18	8	4	
7	17	19	8	5	
8	18	18	10	8	
9	12	18	10	7	
10	19	17	11	8	
11	15	19	12	5	
12					
13	15.3	18.1	10.5	6	mean
14	2.16281709	1.72884033	1.840893503	1.632993162	std dev
15					
16		0% vs 10%	0% vs 20%	0% vs 30%	t test
17		0.00522155	4.8221E-005	5.4118E-009	p values
18					
19			10% vs 20%	10% vs 30%	t test
20			1.9730E-008	4.1843E-012	p values
21					
22				20% vs 30%	t test
23				0.000018641	p values
24					
25					

Depending on how the preferences are set up, the p values that are reported for the t test might only go to two decimal places. In that case, $p < 0.01$ will appear as zero.