

How can I find P-values in Google Sheets?

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RECOMMENDED CITATION

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To find P-values in Google Sheets, follow these steps:

1. Calculate the test statistic for your data.
2. Determine the degrees of freedom for your data.
3. Use the T.DIST function to find the probability density of the test statistic.
4. Multiply the result by 2 to get the two-tailed P-value.
5. Format the cell as a number to get the P-value in decimal form.
6. Alternatively, you can use the T.DIST.2T function to directly get the two-tailed P-value.
7. Repeat the steps for one-tailed P-value if needed.

By following these steps, you can easily find P-values in Google Sheets for your statistical analysis.

Find P-Values in Google Sheets (Step-by-Step)

The easiest way to calculate p-values in Google Sheets is to use the T.TEST() function, which finds the p-value associated with a t-test and uses the following syntax:

T.TEST(range 1, range2, tails, type)

where:

range1: The first sample of data
range2: The second sample of data
tails: The number of tails to use for the test
type: The type of t-test
1: One-tailed (or "one-sided") t-test
2: Two-tailed (or "two-sided") t-test
1: Paired t-test
2: Two sample t-test with equal variance
3: Two sample t-test with unequal variance

This function returns the p-value that corresponds with

the t-test.

The following step-by-step example shows how to use this function in practice.

Step 1: Create the Data

First, let's create a fake dataset that contains the height of two different plant species:

	A	B	C	D
1	Species 1 Height	Species 2 Height		
2	14	15		
3	15	17		
4	15	14		
5	16	17		
6	13	14		
7	8	8		
8	14	12		
9	17	19		
10	16	19		
11	14	14		
12	19	17		
13	20	22		
14	21	24		
15	15	16		
16	15	13		
17	16	16		
18	16	13		
19	13	18		
20	14	15		
21	12	13		
22				
23				
24				
25				
26				

Step 2: Calculate the P-Value of the t-Test

Next, suppose we want to perform a t-test to determine if the mean height between the two plant species is equal.

The following screenshots show which formulas to use to calculate the p-values of the tests.

Paired Samples t-Test

We can use the following formula to calculate the p-value for a :

	A	B	C	D	E	F
1	Species 1 Height	Species 2 Height		P-value		
2	14	15		0.1586		
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 1)		
4	15	14				
5	16	17				
6	13	14				
7	8	8				
8	14	12				
9	17	19				
10	16	19				
11	14	14				
12	19	17				
13	20	22				
14	21	24				
15	15	16				
16	15	13				
17	16	16				
18	16	13				
19	13	18				
20	14	15				
21	12	13				
22						
23						
24						

The p-value turns out to be 0.1586. Since this is not less

than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.

Two Sample t-Test with Equal Variance

D3 fx =T.TEST(A2:A21, B2:B21, 2, 2)					
	A	B	C	D	E
1	Species 1 Height	Species 2 Height		P-value	
2	14	15		0.5300	
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 2)	
4	15	14			
5	16	17			
6	13	14			
7	8	8			
8	14	12			
9	17	19			
10	16	19			
11	14	14			
12	19	17			
13	20	22			
14	21	24			
15	15	16			
16	15	13			
17	16	16			
18	16	13			
19	13	18			
20	14	15			
21	12	13			
22					
23					
24					

The p-value turns out to be 0.5300. Since this is not less than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.

Two Sample t-Test with Unequal Variance

We can use the following formula to calculate the p-value for a two sample t-test with unequal variance:

	A	B	C	D	E	F
D3	=T.TEST(A2:A21, B2:B21, 2, 3)					
1	Species 1 Height	Species 2 Height		P-value		
2	14	15		0.5302		
3	15	17		=T.TEST(A2:A21, B2:B21, 2, 3)		
4	15	14				
5	16	17				
6	13	14				
7	8	8				
8	14	12				
9	17	19				
10	16	19				
11	14	14				
12	19	17				
13	20	22				
14	21	24				
15	15	16				
16	15	13				
17	16	16				
18	16	13				
19	13	18				
20	14	15				
21	12	13				
22						
23						

The p-value turns out to be 0.5302. Since this is not less than $\alpha = .05$, we fail to reject the null hypothesis of the test. We do not have sufficient evidence to say that the mean height between the two species is different.