

TOPIC: GOODNESS OF FIT USING A TI-84

Goodness of Fit Test Using a TI-84

◆ To run a G.O.F. test on a TI-84, use the **D: χ^2 GOF-Test** function.

EXAMPLE

A company surveys 200 customers about their preferred flavor of a new drink: Lemon, Berry, Mango, or Peach. The observed counts are below. Test at the 5% sig. level whether customer preferences are equally distributed among the flavors.

Flavor	Lemon	Berry	Mango	Peach
Obs. Freq.	48	58	42	52

H_0 :

H_a :

$n = \underline{\quad}$ $k = \underline{\quad}$ $E = \underline{\quad}$

Because P -value [< | >] α , we [**REJECT** | **FAIL TO REJECT**] H_0 . There is [**ENOUGH** | **NOT ENOUGH**] evidence to conclude that the obs. freq's do not match the claimed distribution, therefore it [**IS** | **IS NOT**] a good fit for flavor preferences.



HOW TO: G.O.F. Test Using a TI-84

- 1) **STAT**, **1:Edit...**
Enter obs. freq's in **L1**
exp. values in **L2**
- 2) **STAT**, **>** **TESTS**
✓ **D: χ^2 GOF-Test**
- 3) **Observed: L1**
Expected: L2
df:
Calculate **Draw**

Recall

n = total samp. size
 k = # of categories
 $E = \frac{n}{k}$, $df = k - 1$

PRACTICE

A student performs a Goodness of Fit Test using technology to see if the proportion of each candy flavor in a bag matches the expected distribution. They get the following results: $\chi^2 = 18.99$ & $p = 0.0019$. What can they conclude about the claimed distribution of candy flavors?

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EXAMPLE

A camping retailer is interested in improving their stocking decisions, so they check the claim that they are selling the same amount of each of their four brands of tents (A, B, C, and D) by collecting a sample of 160 tents they have sold over the past year. They get the results in the table below.

Tent Brand	A	B	C	D
Number Sold	61	25	44	30

(A) Perform a Goodness of Fit Test with $\alpha = 0.01$ to test the claim.

H_0 : Observed frequencies [**DO** | **DO NOT**] match claimed distribution.

H_a : Observed frequencies [**DO** | **DO NOT**] match claimed distribution.

Because P -value [**<** | **>**] α , we [**REJECT** | **FAIL TO REJECT**] H_0 .

There is [**ENOUGH** | **NOT ENOUGH**] evidence to suggest H_a is true.

So, the claimed dist. [**IS** | **IS NOT**] a good fit.

(B) Does the test provide enough evidence to say the retailer should stop stocking the same amount of each tent?



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▼ D:χ²GOF-Test
- 3) **Observed:L1**
Expected:L2
df:
Calculate **Draw**

Recall

$$E = \frac{n}{k} \text{ (claimed prob's SAME)}$$

$$E = np \text{ (claimed prob's DIFF)}$$

EXAMPLE

A store is doing an email coupon giveaway with promotional ads that give the chance of getting each type of coupon. A business bureau wants to investigate whether the ad reports the actual distribution for the coupons, so they sample 1000 emailed coupons and record the number of coupons for each discount amount.

Coupon	\$5 off	\$10 off	\$15 off	\$20 off	\$50 off
Expected (%)	50%	20%	15%	10%	5%
Actual Count	615	213	72	81	19

(A) Perform a Goodness of Fit Test with $\alpha = 0.1$ to test the claim.

H_0 : Observed frequencies [**DO** | **DO NOT**] match claimed distribution.

H_a : Observed frequencies [**DO** | **DO NOT**] match claimed distribution.

Because P -value [**<** | **>**] α , we [**REJECT** | **FAIL TO REJECT**] H_0 . There is [**ENOUGH** | **NOT ENOUGH**] evidence to suggest H_a is true. So the claimed dist. [**IS** | **IS NOT**] a good fit.

(B) If the claimed distribution is not accurate, the store will have to correct their ads. Will they need to correct their ads?

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EXAMPLE

A high school claims that the commuting habits for incoming freshman will match the distribution of last year's class, so they collect data on a random sample of 100 students and their commuting habits to test the claim.

Method	Car	Bus	Walk	Bike	Other
Expected (%)	63%	28%	6%	2%	1%
Actual Count	68	23	5	2	2

(A) Perform a Goodness of Fit Test with $\alpha = 0.05$ to test the claim.

H_0 : Observed frequencies [DO | DO NOT] match claimed distribution.

H_a : Observed frequencies [DO | DO NOT] match claimed distribution.

Because P -value [< | >] α , we [REJECT | FAIL TO REJECT] H_0 .

There is [ENOUGH | NOT ENOUGH] evidence to suggest H_a is true.

So, the claimed dist. [IS | IS NOT] a good fit.

(B) Should the school do further research on the commuting habits of the upcoming class, or can they assume commuting habits remain the same for the incoming class?



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