Section 6.5 - Chi-Square Tests

We have performed hypothesis tests involving the population proportion:

A more general test involves situations with more than two outcomes:

Suppose we rolled a die.

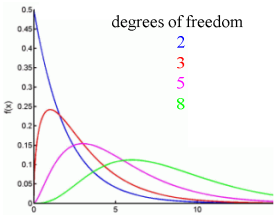
Can we conclude the die is not "fair"?

Roll one die 600 times.

X	Observed
1	115
2	97
3	91
4	101
5	110
6	86

The Chi-Square Distribution - χ^2

A Family of Curves - minimum is 0, no maximum
Skewed
Nature of the curve depends on the degrees of freedom
Used to test for differences among proportions



We will use this test for two situations:

(1) We can test to see if a set of outcomes matches theoretical probability.
This is a "goodness of fit" test.
Does the result of an experiment match what is supposed to happen?

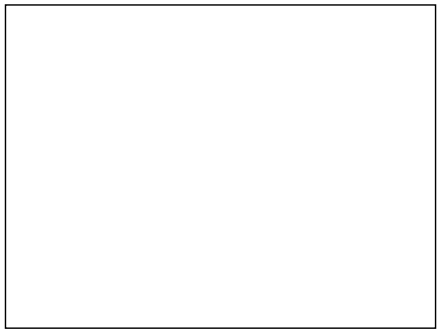
(2) We can test to see if variables are independent.

But what's the catch?
Assumptions:

Roll one die 600 times.

X	Observed
1	115
2	97
3	91
4	101
5	110
6	86

Another situation which uses the Chi-Square Test Statistic: Contingency Tables!



In an experiment to study the dependence of hypertension on smoking habits, the following data were collected on 180 individuals:

	HBP	No HBP
Nonsmoker	21	48
Moderate Smoker	36	26
Heavy Smoker	30	19

TI-84

Put the observed values in a matrix.
2nd Matrix
Edit [A]
3 X 2 input observed values

Put the expected values in a matrix.
2nd Matrix
Edit [B]
3 X 2 input expected values
Enter

TI-89

Put the observed values in a matrix.
Apps
Data/Matrix
- New
- Type Matrix
- Variable: obs
- Row Dimensions: 3
- Column Dimensions: 2

Call up the Chi Square 2way
- Stat/List Editor
- 2nd F6
- Chi2 2-way
- Observed Mat: obs
- Enter