The voters vote for A and B with a probability p and (1-p) repectively equal to 0.6 and 0.4 – Now using the pool of 600 voters, we want to check out this – It's very much like the ski wax testing example we had in class. The problem there was to see if the probability between the two skis were equal (both 0.5)- Now we want to test if the results from the pool is compatible with the probability given above.

How many voters on 600 would vote for A if the starting hypothesis was correct, ie if ideed 60% favored him?
We would expect 600x0.60=360 people to say "yes, I vote for A"– Now only 330 people are saying it so A is missing 30 people. Is that significant??

Well, just like for the ski wax problem, the number of chosing w votes in A in a total of N voters is $\frac{N!}{w!(N-w)!}p^w(1-p)^{N-w}$ with p=0.6
We saw that then the mean of the distribution was
$\overline{w}$=Np=360 and the σ_w=$\sqrt{Np(1-p)}$=$\sqrt{144}$=12.

So missing 30 people is 2.46 sigma (standard deviations) from what was expected. Now because N is so large, the binomial distribution can be approximate by a gaussian and you can use the pages distributed in class to check what is the probability of being 2.46 sigma **below** from the expected value for a normal(gaussian) distribution. Because we are not checking the probability to be 2.46 sigma away but only that of being 2.46 sigma **below** the mean, you have to use either Appendinx A divided by 2 or appendix B. This gives you a probability about 0.7%. So the result is highly significant and we can reject the claim of candidate A at better than the 1% Confidence Level.

2) χ^2= $\sum_{k=1}^{N}\frac{(O_k-E_k)^2}{E_k}$= χ^2/d=10.0625/5=2.0125
The measured distribution can be rejected at the CL% Confidence Level, if P($\tilde{\chi^2} \geq \tilde{\chi^2_o}$) $\leq$ CL%
P($\tilde{\chi^2} \geq$ 2.0125) = 7.5% $\geq$ 5%
The distribution cannot be rejected at the 5% level (but can be rejected at the 10% level).