**Confidence interval for the proportion**

**9.53 (a)** A random sample of 200 voters in a town is selected, and 114 are found to support an annexation suit. Find the 96% confidence interval for the fraction of the voting population favoring the suit.

**(b)** What can we assert with 96% confidence about the possible size of our error if we estimate the fraction of voters favoring the annexation suit to be 0.57?

$$\hat{p}= \frac{114}{200}=0.57$$

Z0.02 = 2.05

C.I : $0.57-\left(2.05\right)\*\sqrt{\frac{0.57\*0.43}{200}}<p< 0.57+\left(2.05\right)\*\sqrt{\frac{0.57\*0.43}{200}} $

0.5 < p < 0.64

b) $e will not exceed : 2.05\*\sqrt{\frac{0.57\*0.43}{200}}=0.0718$

**9.67** A clinical trial was conducted to determine if a certain type of inoculation has an effect on the incidence of a certain disease. A sample of **1000** rats was kept in a controlled environment for a period of **1** year, and **500** of the rats were given the inoculation. In the group not inoculated, there were **120** incidences of the disease, while **98** of the rats in the inoculated group contracted it. If ***p*1** is the probability of incidence of

the disease in uninoculated rats and ***p*2** the probability of incidence in inoculated rats, compute a **90%** confidence interval for ***p*1 *− p*2**.









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**Confidence interval for Variance**

**9.72** A random sample of 20 students yielded a 𝑚𝑒𝑎𝑛𝑜𝑓 𝑥̅ = 72 and a variance of 𝑠2= 16 for scores on a college placement test in mathematics. Assuming the scores to be normally distributed, construct a 98% confidence interval for 𝜎2.

