

STAT/MA 416 Fall 09 Section 002

Homework 8

Due: October 30, 2009, 9:30am

Please show all your work, don't just write down the final number.

- Reading: Chapter 6.2.1-6.2.4, handout on the DeMoivre-Laplace limit theorem
 - Exercises: 6.2.6, 6.2.7, 6.2.13, 6.2.23 (use Proposition 3 in Chapter 5 for (ii)),
 - Ross (8th edition, problems should match the 7th edition)
- 5.19 Let X be a normal random variable with mean 12 and variance 4. Find the value of c such that $P(X > c) = 0.1$.
- 5.22 The width of a slot of a duralumin forging is (in inches) normally distributed with $\mu = .9000$ and $\sigma = 0.0030$. The specification limits were given as $.9000 \pm 0.0050$.
- (a) What percentage of forgings will be defective?
 - (b) What is the maximum allowable value of σ that will permit no more than 1 in 100 defectives when the widths are normally distributed with $\mu = 0.9000$ and σ ?
- 5.28 Twelve percent of the population is left handed. Approximate the probability that there are at least 20 left-handers in a school of 200 students. State your assumptions.
- 5.32 The time (in hours) required to repair a machine is an exponentially distributed random variable with parameter $\lambda = \frac{1}{2}$. What is
- (a) the probability that a repair time exceeds 2 hours?
 - (b) the conditional probability that a repair takes at least 10 hours, given that its duration exceeds 9 hours?
- 5.33 The number of years a radio functions is exponentially distributed with parameter $\lambda = \frac{1}{8}$. If Jones buys a used radio, what is the probability that it will be working after an additional 8 years?