

- 1a. Let  $X_1, X_2, \dots, X_n$  is a random sample of size  $n$  from a normal distribution  $N(\mu, \sigma^2)$ .  
Show that  $\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$  is  $N(\mu, \sigma^2/n)$ . (Hint Use the moment generating function).
- b. Problem 5.1-2
- 2a. Problem 6-1-8
- b. Problem 5.6-3
- 3a. A random sample with  $n = 37$  was taken. The sample characteristics were  $\bar{x} = 11.95$  and  $s = 11.80$ . Find the approximate 95% confidence interval for the the mean  $\mu$ .
- b. Let  $X$  equal the excess weight of soap in a 1000 gram bottle. Assume that the distribution of  $X$  is  $N(\mu, 169)$ . If a random sample of size 25 is taken and  $\bar{x} = 36$ . Find a 90% confidence interval for  $\mu$ .
4. Problem 6.4-3 in the text.