MA381 Introduction to Probability, HW 6

Instructions: This homework will be collected at the beginning of class Thursday, Jan. 7. Selected problems will be graded in depth; remaining problems will be awarded completion credit.

0: Be sure to read chapter 4, section 4.5, and chapter 5, section 5.1.

1: Problem 3, pg. 182

2: Problem 4, pg. 182

3: Problem 5, pg. 182

4: Problem 7, pg. 182

5: Problem 1, pp. 196-197.

6: Problem 7, pp. 196-197.

7: Problem 13, pp. 196-197.

8. (*Is it binomial?*). For each of the following RV's state whether it is exactly binomial, approximately binomial (can be adequately modeled as binomial), or neither exactly binomial nor approximately binomial. If the RV is exactly binomial or approximately binomial, give the appropriate values for n and p.

i. Suppose we toss a pair of 6-sided dice 10 times. Let Y be the number of "snake eyes" we get in the 10 tosses. (Recall that "snake eyes" means we get "1" on each die.)

ii. Jack and Jill suck at basketball (they misspent their youth fetching water) but they play anyway even though they make only 20% of their shots. Let Y be the number of shots Jack and Jill take at the start of a game until one of them makes a basket.

iii. Many component manufacturers ship out their product in batches. They can use a quality control method called *acceptance sampling* in which a small sample of components in each batch of components is carefully checked. If the number of defectives in the sample does **not** exceed a certain number, the batch is shipped, otherwise it is subjected to additional inspection. Let Y be the number of defectives in a sample of size 10 from a batch of 400 components, 20 of which are defective.

iv. Let Y again be the number of defectives in a sample of size 10 but in this case the batch only has 80 components, 4 of which are defective.