Stat 185 - Exam 2

Name:_____

Please write all your solutions (answers with organized supporting work) on separate paper, put your name on this sheet, and staple it all together when you turn it in.
I don't plan to grade anything written on the exam sheet itself.

1. I've got a bunch of 12 sided dice with five sides labeled 1, two sided labeled 2, and five sides labeled 3

    (a) Suppose I roll one such die. What is the probability that I roll a 2 or a 3?

    (b) Suppose I roll two such dice. What is the probability that I roll a 2 and a 3?

    (c) Suppose I roll 1 such die. Write down a specific formula to show that the expected value of my roll is 3.

    (d) Suppose I roll 100 such dice and add the results. What is the expected value of my sum?

2. Table 1 displays in-state UNCA enrollments for last Fall by region. Suppose we pick a random sample of 50 of those 3281 total students. What is the probability that exactly 28 of those 50 students are *not* from Western NC?

3. Referring again to our random sample of 50 of 3281 total students from table 1, use a normal distribution to estimate the probability that more than 28 of those 50 students are *not* from Western NC.

4. Suppose now that we are interested in the proportion of in-state UNCA students who are from outside Western NC *this* year. Since data on the entire student body is not yet available for this year, we draw a simple random sample of 64 in-state UNCA students and find that 34 of them are from outside Western NC. Use this data to write down a 95% confidence interval for the proportion of in-state UNCA students who from outside Western NC.

Region	Western NC	Piedmont	Eastern NC	Total
Enrollment	1508	1541	232	3281

Table 1: In state UNCA Enrollment by NC Region

5. UNCA claims that 90% of it's students are from North Carolina but we suspect that it might be less than that. Suppose we draw a random sample of 50 UNCA students and find that 41 of them are in state. Let's use this to explore the claim that 90% of UNCA students are in-state vs the possibility that fewer than 90% of UNCA students are in-state.

   (a) Construct appropriate null and alternative hypotheses to explore our question.

   (b) Compute the associated p-value.

   (c) Based on a 95% level of confidence, what is the conclusion of our hypothesis test?