

Review Assignment: Chapters 4-6

1. A new game show has a roulette style wheel evenly divided into 200 sections.
 - 80 of the sections are red
 - 80 of the sections are white, and
 - 40 of the sections are blue.

In addition, 4 of the blue sections are marked as Bonus sections.

Find the probability that a spin of the wheel turns up

- (a) a white section.
 - (b) a red or a blue section.
 - (c) a Bonus section.
 - (d) a red section or a Bonus section.
2. State the values of n , p , q and r in the binomial experiments below (using the wheel described above), and find the requested probabilities.

A contestant spins the wheel 12 times,

- (a) what is the probability that a white section will come up more than 7 times?
 - (b) what is the probability that a blue section will come up 3 or fewer times?
 - (c) what is the probability that exactly 4, 7 or 8 of the spins will come up either red or blue?
3. Suppose we keep track of 90 spins (of the wheel described above).
 - (a) What is the expected number of times a white section comes up?
 - (b) What is the standard deviation in the number of times a white section comes up?
 - (c) Use the normal approximation to the binomial distribution in order to find
 - i. the probability that white comes up fewer than 30 times.
 - ii. the probability that white comes up between 40 and 50 times.(Don't forget the "continuity correction"!)
 4. Suppose we keep track of 90 spins (of the wheel described above).
 - (a) What is the expected number of times a Bonus section comes up?
 - (b) What is the standard deviation in the number of times a Bonus section comes up?
 - (c) Explain why we cannot use the normal distribution to approximate this binomial experiment.