College Prep Stats
Chapter 4 Review

Name: _____

Round answers to the thousandths place, unless otherwise specified.

For numbers 1 – 10, use the data in the accompanying table (based on data from "Helmet Use and Risk of Head Injuries in Alpine Skiers and Snowboarders," by Sullheim, eta l., Journal of the American Medical Association, Vol. 295, No. 8).

	Head Injuries	**Not Injured**	**Totals**
Wore Helmet	96	656	752
No Helmet	480	2330	2810
Totals	576	2986	3562

1. If one of the subjects is randomly selected, find the probability of selecting someone who was not injured.

2. If one of the subjects is randomly selected, find the probability of selecting someone who did not wear a helmet.

3. If one of the subjects is randomly selected, find the probability of selecting someone who had a head injury or did not wear a helmet.

4. If one of the subjects is randomly selected, find the probability of selecting someone who wore a helmet or was not injured.

5. If one of the subjects is randomly selected, find the probability of selecting someone who wore a helmet and was injured.

6. If one of the subjects is randomly selected, find the probability of selecting someone who did not wear a helmet and was not injured.

7. If two different study subjects are randomly selected, find the probability that they both wore helmets. (assume without replacement)

8. If two different study subjects are randomly selected, find the probability that they both had head injuries. (assume without replacement)

9. If one of the subjects in randomly selected, find the probability of selecting someone who did not wear a helmet, given that the subject had head injuries.

10. If one of the subjects is randomly selected, find the probability of selecting someone who was not injured, given that the subject wore a helmet.

11. About 35% of the population has blue eyes (based on a study by Dr. P. Sorita Soni at Indiana University).

a) If someone is randomly selected, what is the probability that he or she does not have blue eyes?

b) If four different people are randomly selected, what is the probability that they all have blue eyes?

c) Would it be unusual to randomly select four people and find that they all have blue eyes? Why or why not?

12. a) If a person is randomly selected, find the probability that his or her birthday is October 18, which is National Statistics Day in Japan. Ignore leap years.

b) If a person is randomly selected, find the probability that his or her birthday is in October. Ignore leap years.

13. For a recent year, the fatality rate from motor vehicle crashes was reported as 15.2 per 100,000 population.

a) What is the probability that a randomly selected person will die this year as a result of a motor vehicle crash? Round to 6 decimal places.

b) If two people are randomly selected, find the probability that they both die this year as the results of motor vehicle crashes. Round to 9 decimal places.

c) If two people are randomly selected, find the probability that neither of them dies this year as the result of motor vehicle crashes. Round to 4 decimal places.

14. A spinner has 15 equal sectors, numbered 1 – 15. What is the probability of spinning a number less than 9 or a multiple of 3?

15. A sample of 4 different calculators is randomly selected from a group containing 16 that are defective and 30 that have no defects. What is the probability that at least one of the calculators is defective?

16. A pollster for the Gosset Survey Company claims that 30 voters were randomly selected from a population of 2,800,000 eligible voters in New York City (85% of whom are Democrats), and all 30 were Democrats. The pollster claims that this could easily happen by chance. Find the probability of getting 30 Democrats when 30 voters are randomly selected from this population. Based on the results, does it seem that the pollster is lying?

17. Based on data from the U.S. Center for Health Statistics, the death rate for males in the 15 – 24 age bracket is 114.4 per 100,000 population, and the death rate for females in that same age bracket is 44.0 per 100,000 population.

a) If a male in that age bracket is randomly selected, what is the probability that he will survive? (express the answer with six decimal places.)

b) If two males in that age bracket are randomly selected, what is the probability that they both survive? (express the answer with six decimal places.)

c) If two females in that age bracket are randomly selected, what is the probability that they both survive? (express the answer with seven decimal places.)

18. Each of two parents has the genotype dimples/no dimples which consist of a pair of alleles that determine your face, and each parent contributes one of those alleles to a child. Assume that if the child has at least one no dimples allele, that will dominate and they will not have dimples.

a) List the different possible outcomes.

b) What is the probability that a child will have dimples?

~~19. If a horse has a probability of winning of 5/9, what are the odds against the horse winning?~~

~~20. Assuming the payoff odds are the actual odds you found in #21, if you place a $10 bet to win on that horse, what is the winning ticket worth?~~

21. Assume that an actress has a 97% chance of performing in a Broadway show if she gets the part.

a) What is the probability that an actress will **not** perform in a Broadway show if she gets the part.

b) If you have two actresses, what is the probability they both literally "break a leg" and can't go on?

c) What is the probability at least one of the actresses will perform? (make sure you use your answer from part b) above)

~~22. Suppose you are playing a game of chance and your probability of winning is 2:9. What are the odds against winning?~~

~~23. Suppose your payoff odds against winning are the actual odds from number 22 above. How much will an $8 bet be worth?~~

24. You are dealt two cards from a shuffled deck of 52 playing cards.

a) Find the probability that both cards are red. The cards are dealt without replacement.

b) Find the probability that both cards are red. The cards are dealt with replacement.

25. Find the probability of correctly answering the first 5 questions on a multiple choice test if random guesses are made and each question has 6 possible answers. (express answer to four decimal places.)

26. An unprepared student makes random guesses for the ten true-false questions on a quiz. Find the probability that there is at least one correct answer.