

Names: _____

Section: _____

Take Home Group Project

Due at the beginning of class on April 6.

Instructor: J. Haga

To receive full credit, you must show all of your work. A correct answer unaccompanied by a complete set of work will receive little or no credit. Solve all problems using the methods introduced in lecture. Please write your answers in the boxes provided.

1. Calculate the following probabilities:

(a). Rolling an odd number on a regular 6-sided die.

(b). Rolling a 3 or a 5 on a regular 6-sided die, given that you roll an odd number.

(c). Rolling 2 dice whose sum is 9.

(d). Rolling 2 dice whose sum is 7 given that one of the dice comes up as a 5.

(e). Rolling at least one 5 on a roll of two dice, given that the sum of the two dice is 7.

(f). Rolling 7 dice, where at least one of the 7 dice comes up as an even number.

(g). That you are dealt 4 cards of the same rank, and 1 card of a different rank, in a 5-card hand.

(h). That you are dealt 5 cards of the same suit in a 5-card deal.

(i). That you are dealt a “royal flush” (a royal flush is 10,J,Q,K and A of the same suit).

- (j). That you are dealt 3 cards of one rank, and 2 additional pairs of distinct ranks, in a 7-card hand.

- (k). That you are dealt a “full house” in poker? (A full house is a hand consisting of 2 cards which are of the same rank, and 3 cards which are of the same rank, different than the other 2. For instance, the hand (10♣,10♥,2♠,2♣ and 2♥) is a full house).

2. Suppose that you have been watching the new hit show “Basketball with the Stars”, and have been tracking the performance of 3 stars over the last 3 weeks.

Name of Celebrity	Number of Free Throws attempted in the last 3 weeks	Number of free throws made in the last 3 weeks
Natasha Henstridge	14	8
Vin Diesel	16	3
Barbara Walters	13	12

(a). Supposing that each of the stars performs as well today as they have been in the last 3 weeks, estimate the probability that each star will make their next free throw.

Name of Star	Probability that they will make it
Natasha Henstridge	
Vin Diesel	
Barbara Walters	

(b). Using the probabilities in part (a), calculate the odds against each star making their next free throw.

Name of Horse	The odds against them making their free throw
Natasha Henstridge	
Vin Diesel	
Barbara Walters	

(c). Suppose that you place and a friend are real enthusiasts of the show, and your friend wants to make a fair wager that his favorite 3 stars (Natasha Henstridge, Vin Diesel and Barbara Walters) will make their next 3 free throws. Calculate the odds of each star making their shot, and write them in the table below.

Name of Star	The amount of money you'd receive from your friend if the star made their next free throw (including the initial \$10 bet)
Natasha Henstridge	\$12.00
Vin Diesel	\$11.00
Barbara Walters	\$40.00

If you have \$30 for the purpose of betting on each of these 3 celebrities and they perform in a manner consistent with their previous record, how much money do you expect to leave with at the end of the day?

3. A study done by the Texas Employment Commission in January 1996 resulted in the following employment data for Tarrant County:

Civilian Labor Force	Employment	Unemployment	Total
Black	67,071	7,770	74,841
Hispanic	69,486	5,049	74,535
Other minority	19,067	1,266	20,333
Non-minority	520,557	21,378	941,935
Total	676,181	35,463	711,644

(a). (5 points) What is the probability that a randomly chosen employed person in Tarrant County is a non-minority?

(b). (5 points) What is the probability that a randomly person chosen who is neither Black nor Hispanic is unemployed?

(c). (10 points) What is the probability that a randomly chosen person in Tarrant County is employed or other minority?

4. Suppose that the Enviro-Smile car company manufactures only blue and yellow cars. Suppose that 35% of all blue cars manufactured are sedans, but only 10% of the yellow cars are sedans. Further suppose that 33% of all cars manufactured by Enviro-Smile are blue.

(a). (10 points) What is the probability that a randomly chosen car, manufactured by Enviro-Smile, is a sedan?

(b). (10 points) You tell a salesman that you want to buy a sedan, but you want them to surprise you with the color. What is the probability that the sedan you get is blue?