Probability Worksheet #7
October 8, 2018
2 Points

Circle one name.

Name: _____ **Name:** _____ **Name:** _____

Note: $P(E|F) = \frac{\text{size of } E \cap F}{\text{size of } F}$.

Note: Two events E and F are said to be independent if $P(F|E) = P(F)$.

1. The stats for a sports team's season are given in the table. This team has a star player who got injured in the middle of the season. The table records wins and losses and whether the star player was in or not in the game:

	Wins	Losses	Total
Star In	12	4	16
Star Out	15	5	20
Total	27	9	36

Suppose a game is chosen at random.
Let E be the event "the star player was in the game."
Let F be the event "the team won the game."
Express each statement in probability notation and then calculate the result.

(a) What is the probability of picking a game that the star player played in?

(b) What is the probability of picking a winning game?

(c) What is the probability of picking a game that has the star player in it and was a winning game?

(d) What is the probability of picking a game that has the star player in it or was a winning game?

(e) What is the probability of picking a winning game given that the chosen game has the star player in it?

(f) What is the probability of picking a game that has the star player in it given that the chosen game was a winning game?

(g) Based on these calculations, are the events E and F independent?

2. The CDC is testing a population for a disease. The test gives the correct result 1% of the time. Below is a table of the population indicating how the test came out.

	Test is Positive	Test is Negative
Has Disease	99	1
Doesn't Have Disease	100	9900

A person is selected at random.
Put E be the event that the person has the disease.
Let F be the event that the person tests positive for the disease.
Express each statement in probability notation and then calculate the result.

(a) The probability that the person has the disease.

(b) The probability that the person does not have the disease.

(c) The probability that the person tested positive for the disease.

(d) The probability that the person has the disease or tested positive for the disease.

(e) The probability that the person has the disease and tested positive for the disease.

(f) The probability that the person tested positive for the disease, given that they have the disease.

(g) The probability that the person has the disease, given that they tested positive for the disease.

(h) Based on these calculations, are the two events E and F independent or not?