The Meaning of Probability

<u>Ex 1:</u>
1a) When drawing a chip from a bag, the probability of drawing a blue chip is 25%. What does this probability mean?

1b) If you draw a chip from the bag 80,000 times, how many times will you get a blue chip?

1b') If you draw a chip from the back 200,000 times, how many times will you get a blue chip?

1c) If you draw a chip from the bag infinitely many times, what percent of the time will you draw a blue chip?

2a) When drawing 2 cards from a deck of cards, the probability of getting a total of 20 is 10.26%. What does this probability mean?

2b) If you play 72,000 hands of blackjack, how many times will you start with a total of 20?

2c) If you draw 2 cards from a deck of cards infinitely many times, what percent of the time will the total be 20?

Ex 3:
3a) When rolling a pair of dice, the probability of getting a total of 7 is 16.7%. What does this probability mean?

3b) If you roll a pair of dice 180,000 times, how many times will you get a total of 7?

3c) If you roll a pair of dice infinitely many times, what percent of the time will you get a total of 7?

<u>Ex 4:</u>
4a) The probability of a coin landing on heads is 50%. What does this probability mean?

4b) If you flip a coin 20,000 times, how many times will it land on heads?

4c) If you flip a coin infinitely many times, what percent of the time will the coin land on heads?

<u>Ex 5:</u>
5a) When drawing a single card from a deck of cards, the probability of getting a heart is 25%. What does this probability mean?

5b) If you draw a single cards from a deck of cards 30,000 times, how many times will you draw a heart?

5c) If you draw a single card from a deck of cards infinitely many times, what percent of the time will the total be 20?

<u>Ex 6</u>:
If your professor plays poker online at the $0.01/$0.02 blind game online, starts with $1.50, and plays until he either doubles his money or loses the entire $1.50, what is the probability that he will double his money?

<u>Ex 7</u>:
What is the probability that a randomly selected NFL game will be tied at halftime?

Compound Events

Experiment
  Roll a single die once
Events
  A = The die lands on an even number
  B = The die lands on a multiple of 3
  C = The die lands on a prime number
  D = The die lands on 4
  E = The die lands on a number bigger than 2
Find
  $A \cup E, \; B \cup D, \; C \cap E, \; B \cap D, \; \bar{B}, \; \bar{E}$
Question:
  Are the events A and B disjoint? How about A and E?

<u>Ex 2:</u>

Experiment
  Draw a single card from a standard poker deck

Events
  A = Draw a heart
  B = Draw a black card
  C = Draw a red face card
  D = Draw a king
  E = Draw a card that has a number on it that is less than 5

Find
  $D \cup E, \ A \cap D, \ \bar{B}$

Question:
  Which pairs of events above are disjoint?