Midterm 1

PSTAT 5A, Summer B, 2018

Name:

Perm #:

Section Time & TA Name (draw a circle):	D.Bernstein TW 2 pm	D.Bernstein TW 3 pm	K. Wang TW 5 pm

Instructions:

- You have 80 minutes to complete the exam.
- Read each question carefully and answer all questions.
- **Round numbers to 3 decimal places.**
- You must show your work clearly: NO WORK=NO CREDIT.
- Anyone found copying another students' work will be given an F for the course.
- You are **NOT ALLOWED** to consult any notes or textbook during this exam.
- You are **NOT ALLOWED** to consult any cellphones, smartphones, computers or electronic device of any form during this exam.
- All cellphones, smartphones and computers must be turned off.
- You may use a calculator. You cannot not use a phone as a calculator.

Questions	Points
1 (40 pts)	
2 (30 pts)	
3 (30 pts)	
TOTAL	

Good Luck!!!

Question 1

a) You flip one coin, roll one dice and draw one card from a deck. All at the same time. Unfortunately, the deck of cards is very old and you can only recognize whether a card is a face or not. And the dice is even worse; only the 6 is still visible. **What is the sample space?**

b) Your friend is running a binomial experiment for his master's thesis project and needs your help. After 50 trials, he believes the mean is 30. **What is the standard deviation?**

c) You draw a card from a deck of cards. And you have the following random variable:

$$Y = \begin{cases} \mathbf{1} & \text{if the card is an ace or an odd number} \\ \mathbf{2} & \text{if the card is an even number} \\ \mathbf{3} & \text{if the card is a face (that is jack, queen or king)} \end{cases}$$

What is the mean of Y?

d) Same setup as c). **What is the standard deviation of Y?**

Question 2

a) You draw a card from a deck of cards. What's the probability that the card is an even number given that is a number?

b) What is the probability that you draw an odd number given that card is black?

c) Now you draw two cards. One at a time with replacement. What's the probability of obtaining two black cards?

Question 3

Jennifer draw cards from a deck, one at a time with replacement. She smiles only if she gets a number. She runs this experiment 3 times.

a. Is this a binomial experiment? Check the conditions.

b. Find the cdf of the number of smiles

c. Find the mean number of smiles

d. If the trials were done without replacement instead. Will this be a binomial experiment? Explain why.