

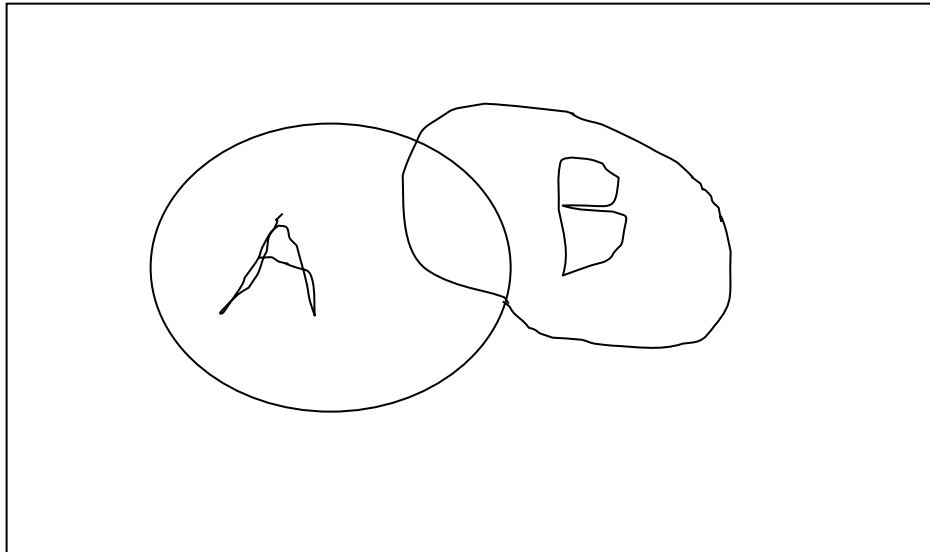
Statistics 108**Exam 2 (11/14/13) 41 points**

- You have 60 minutes to do this exam.
- You are allowed only a calculator, the Z and t-distribution probability sheet, and one 3-by-5 inch note card of notes.
- You will not look at anybody else's exam nor ask any other student about this exam.
- You will take all necessary efforts to prevent others from seeing your exam and will not provide any other student information about this exam. The consequence of using additional test aids, getting information, or providing information to other students will result in disciplinary action.
- When giving a numerical answer, **circle your answer**.

I have read and agree with the above statement. (If not see instructor.)

Signature: _____

1. 3pts. In the below Venn diagram, shade in the area that represents “the intersection of A and not B” which is also written as $A \cap B^c$



2. 3pts. Abby, Betty, Cindy and Diana are going to interview for the same job. How many ways can the four job candidates be sequenced to be interviewed? Show your work.

3. 2pts. Circle **True** or **False**: The below table can be a discrete probability distribution.

X	1	2	3	4	5
P(x)	0.1	0.3	0.5	0.3	0.1

4. 2pts. Circle **True** or **False**: The below table can be a discrete probability distribution.

X	1	2	3	4	5
P(x)	0.2	-0.3	0.6	0.3	0.2

5. 3pts. For the below discrete probability distribution, calculate the mean of random variable X . This is also known as $E(X) = \mu$. Show your work.

X	4	8
P(x)	0.75	0.25

6. 4pts. Suppose the probability of a randomly selected home loan going into default is 0.25 and you follow 8 independent home loans. Using the binomial distribution, calculate the probability of having exactly 2 of the 8 loans go into default. Show your work.

7. 3pts. The total area beneath a probability density curve is _____.

8. Suppose Z is distributed according to the standard normal distribution.
- 3pts. Calculate $P(-2.0 \leq Z \leq 1.20)$ and sketch a graph shading in the region for the probability. Show your work.
 - 2pts. Use the appropriate table to determine the 67th percentile of Z ; that is, find $?$ such that $P(Z < ?) = 0.67$.
9. 3pts. Suppose random variable X has a normal distribution with mean 50 and standard deviation 8. Also suppose a random sample of size $n=16$ will be collected and the sample mean \bar{X} calculated from the sample. Calculate $P(\bar{X} < 44)$. Show your work.
10. 3pts. **Circle** which one statement best describes the key part of the central limit theorem.
- As the sample size increases, the population variance decreases.
 - As the sample size increases, the distribution of the sample means become distributed more like the normal distribution.
 - As the sample size increases, the distribution of the sample becomes distributed like the normal distribution.
 - As the sample size increases, the population becomes distributed more like the normal distribution.

11. 3pts. **Circle** which one statement best describes the key interpretation of a 95% confidence interval for the mean.
- a. A 95% confidence interval is an interval that contains 95% of the population values.
 - b. A 95% confidence interval contains 95% of the data.
 - c. If 100 different random samples were taken from a population and the 95% confidence interval calculated for each sample, we would expect the sample mean to be inside about 95 of the intervals.
 - d. If 100 different random samples were taken from a population and the 95% confidence interval calculated for each sample, we would expect the population mean to be inside about 95 of the intervals.
12. 5pts. A sample of 400 registered California voters were asked if they approve of Governor Brown's performance as governor. 240 of those surveyed replied, "Yes, I approve of the governor's performance." Calculate the 95% confidence interval for the proportion of registered California voters who approve of the governor's performance. Show your work
13. 5pts. The temperatures of 36 students were measured when they entered the health center. The mean temperature was 98.9 degrees with a sample standard deviation of 0.7. Calculate the 95% confidence interval for the mean temperature of students who enter the health center. Show your work.