

Statistics 300 : Spring 2018 Saturday Class

Instructor : L. C. Larsen

Name:

Los Rios ID#:

Signature:

Exam : Unit 2

Time allowed : 2 hours and 5 minutes

Exam window: 3/10, 3/12, and 3/12, 2018.

Resources allowed:

- == > Open textbook (Author: Navidi and Monk)**
- == > Open notes**
- == > Quiz and exam solutions**
- == > Calculator / laptop of choice**
- == > Instructor at 916-346-6324**

Resources not allowed:

- == > Consultants**
- == > Internet**

(6 points; 6 minutes)

1. An experiment was done in which living sperm cells were exposed to intense radiation. As a result, 13% of the cells had damaged (mutated) DNA. In a random sample of 600 of the irradiated sperm cells, would it be unusual to find more than 93 damaged cells? (show your work)

write your final answer here.

write any EXCEL functions you used here.

(6 points; 6 minutes)

2. An experiment was done in which living sperm cells were exposed to intense radiation. As a result, 13% of the cells had damaged (mutated) DNA. In a random sample of 10 of the irradiated sperm cells, what is the probability the 10 irradiated cells will include exactly 2 damaged cells?

write your final answer here.

write any EXCEL functions you used here.

(8 points; 7 minutes)

3. For the two situations below, determine whether each is a proper discrete probability distribution. If it is not a proper probability distribution, then do no more work on the problem. If it is a proper distribution, determine the mean, variance, and standard deviation.

(a)

x	P(x)			
17	0.66			
60	0.25			
81	0.09			

μ	σ^2	σ
formula	formula	formula
value	value	value

(b)

x	P(x)			
17	0.66			
60	0.15			
81	0.09			

μ	σ^2	σ
formula	formula	formula
value	value	value

(3 points; 3 minutes)

4. **Ten trucks are waiting to be loaded. There is enough material to load six of the 10 trucks. The person managing the trucks must select 6 of the trucks and assign the order in which the 6 trucks will be loaded. How many ways could the outcome of this process occur?**

(show some work to support answer)

(5 points; 4 minutes)

5. **You are one of twenty-two people that work in a company. Five of the 22 workers will be sent to New York for special training. How many sets of five workers are possible to select from the 22 workers, and what is the probability that you will get to go to New York for the special training?**

(show some work to support answer)

(3 points; 3 minutes)

6. **A lock uses a touch pad with the letters A B and C and the digits 1 2 3 4 5 6 7 and 8. The unlock code begins with 2 of the letters and ends with 4 of the digits. Each letter and each digit can only used one time, and every different arrangement is a different unlock code. How many different unlock codes are possible?**

(show some work to support answer)

(6 points; 6 minutes)

7. The management of a large company wants to know how much "waste" is produced in their NEW factory. So, management is planning a study to estimate the average amount of waste per day with an accuracy of plus-or-minus 10 kilograms. Management wants to be 90% confident that accuracy will be achieved. Daily waste at their other plants has a standard deviation of about 60 kilograms. For their study, how many days should the company measure "waste"? Look at each day's waste as if it is an independent "random" value.

write the formula (expression) that you are using here

write the formula with values in place here

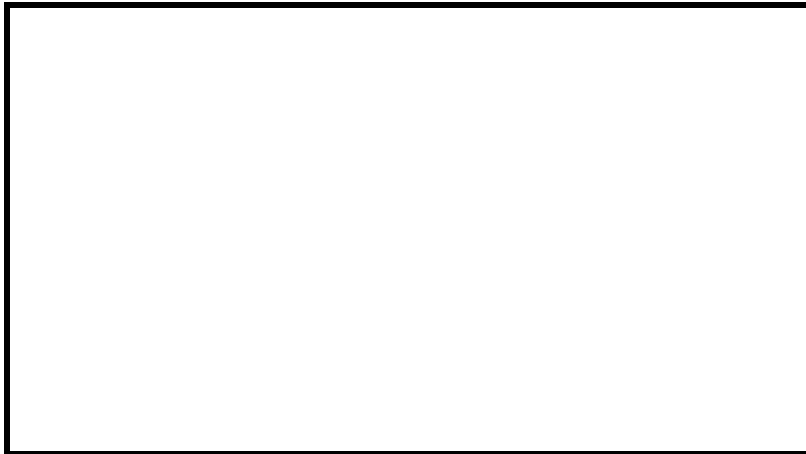
write any EXCEL functions you used here.

write your final answer here.

8. (5 points; 5 minutes)

What is the 88th percentile of the Normal distribution with mean = 45 and standard deviation = 17 ?

Draw picture here (worth 2 points)



write any EXCEL functions you used here.



write your final answer here.

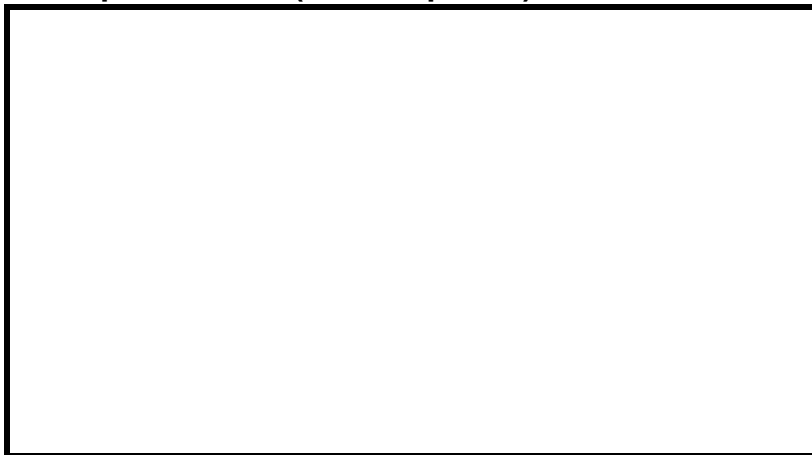


9. (5 points; 5 minutes)

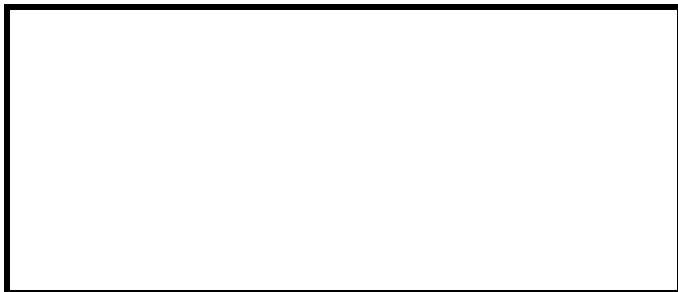
Given: $X \sim N(\mu=45, \sigma=17)$.

What is the probability that a random value of X will be greater than 50?

Draw picture here (worth 2 points)



write any EXCEL functions you used here.



write your final answer here.



10. (6 points; 5 minutes)

Given: $X \sim N(\mu=45, \sigma=17)$.

What is the probability that the average of 36 random values of X will be between 43.9 and 46.3 ?

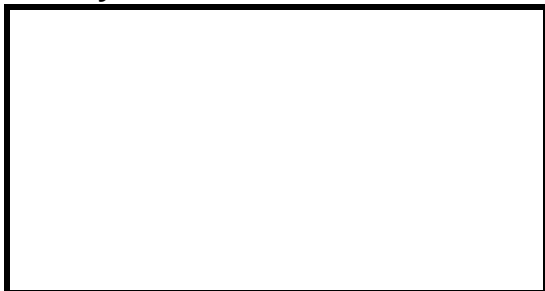
Draw picture here (worth 2 points)



write any EXCEL functions you used here.



write your final answer here.

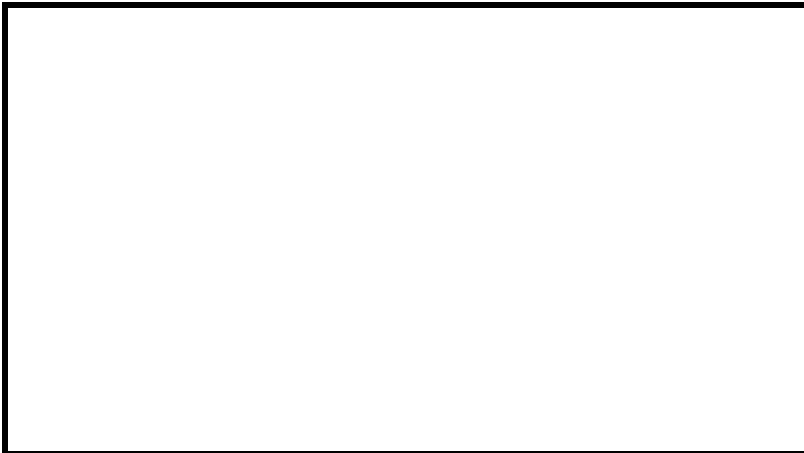


11. (5 points; 5 minutes)

Given: $X \sim U[28.3, 75.9]$.

What is the probability that a random value of X will be greater than 50?

Draw picture here (worth 2 points)



Show how you set up the calculations here.



write your final answer here.

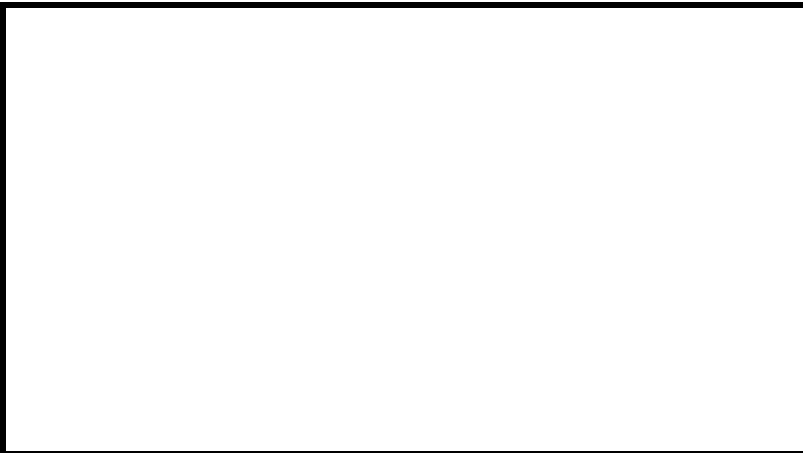


12. (5 points; 5 minutes)

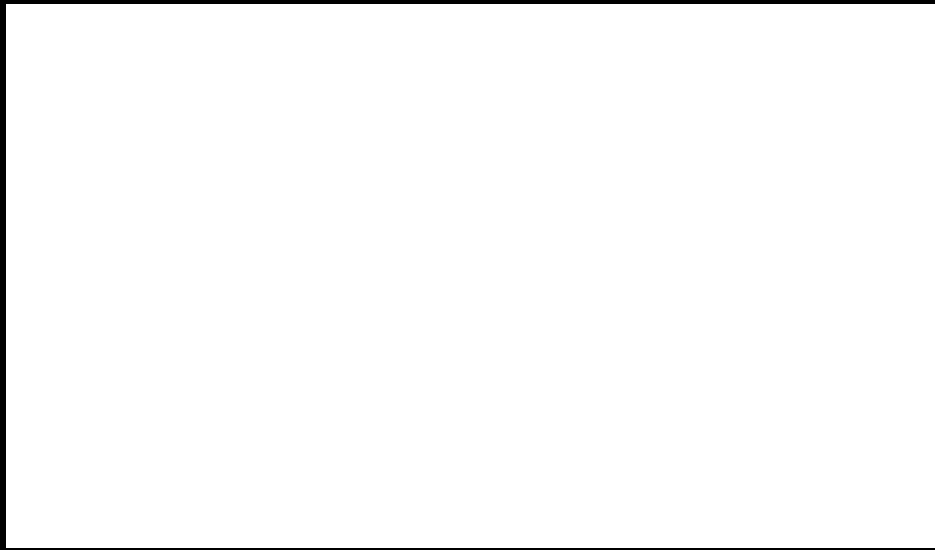
Given: $X \sim U[28.3, 75.9]$.

What is the sixty-third percentile (P_{63}) for this distribution?

Draw picture here (worth 2 points)



Show how you set up the calculations here.



write your final answer here.



13. (5 points; 5 minutes)

Use the data shown here to construct a 98% confidence interval for the mean (μ) of the distribution from which the data were randomly selected.

Data:

3685
7810
2590
4604
6039
6249
1425
5431
7815
6533
5496
4302
1476
4885
5183
7113
2643
3788
6135
7112
1377
7460
1768
3010
5487
6692
1530
5295
7407
6441
2403
3414
7885

write the formula (expression)
that you are using here

write the formula (expression) with the values in place.

write any EXCEL functions you used here:

= average(B11:B43) [example]

write your final answer here here: