Worksheet 10

K-Problems:

Problem 1: Find the values of k for the following probability values:

$P(X < k) = 0.5210$

$P(X \leq k) = 0.256$

$P(X > k) = 0.2714$

$P(X \geq k) = 0.801$

x	F(x)
0	0.05
1	0.10
2	0.15
3	0.25
4	0.30
5	0.38
6	0.46
7	0.52
8	0.63
9	0.73
10	0.81
11	0.92
12	1.00

Problem 2: Find the values of k for the following:

$P(X < k) = 0.69$

$P(X \leq k) = 0.2011$

$P(X > k) = \ 0.9001$

$P(X \geq k) = 0.05$

x	F(x)
0	0.04
1	0.07
2	0.10
3	0.18
4	0.20
5	0.24
6	0.31
7	0.43
8	0.59
9	0.69
10	0.72
11	0.79
12	0.87
13	0.92
14	0.95
15	1.00

Insurance Problems:

Problem 1: An insurance company sold 5,000 policies of $150,000 payout value this year. The probability of death for each person has been determined to be 0.003. The company charges $300 for each policy. Use the Poisson distribution to determine the following:

Rate (λ) =

Money In =

Money Out =

$P(The\ company\ breaks\ even) =$

Probability Notation:	CDF Notation:	Final Answer:

$P(The\ company\ profits\ \$\ 450{,}000) =$

Probability Notation:	CDF Notation:	Final Answer:

$P(The\ company\ loses\ \$\ 450{,}000) =$

Probability Notation:	CDF Notation:	Final Answer:

95-5% Split – Binomial

Problem 1: We are going to toss a fair coin 13 times. Determine the "OK Bet" and "Cheater" Region for this.

If there were 7 Heads tossed, would you bet or not bet?

If the coin is fair is our above decision a theoretical error? If so, will we eventually detect the error?

If the coin is a 70% coin is the above decision a theoretical error? If so, will we eventually detect the error?

Determine the probability of detecting a p = 0.6, 0.7, and 0.8 cheater coin:

Poisson Problems!

Problem 1: The number of online orders a restaurant in UB receives in any 20 minutes time period is well modeled by a Poisson distribution with a mean rate of $\lambda = 4$. Let X count the number of orders received in a time period of 20 minutes. Determine the following probabilities:

$P(X < 4) =$

$P(X \geq 4) =$

$P(1 \leq X \leq 5) =$

$P(4 < X < 7) =$

1.2: Now, consider the new X to be the number of orders received in a time period of 60 minutes. Determine the following probabilities:

What is λ_{new}? $\lambda_{new} =$

$P(X \leq 10) =$

$P(X \geq 18) =$

$P(14 < X \leq 23) =$