

Statistics 107S
Midterm Examination
Exam 2 - March 20, 2003

Name: _____ Student I.D. _____

Please circle the appropriate Section and Tutorial you attend

Radu's section

Emily's section

Tutorial: 1 (12pm) 2 (2pm) 3 (4pm) 4 (6pm)

1. Please **print** your name and student id. number in the above space.
2. This is a closed book, closed-notes examination.
3. Please provide the answers in the corresponding space. If you do not have enough space, please use the back of a nearby page.
4. In order to receive full credit for a problem, you should show all of your work and explain your reasoning. Good work can receive substantial partial credit even if the final answer is incorrect.
5. The total number of points to be obtained is 30 and they are assigned as shown in the table below.

Distribution 1		5
Distribution 2		5
Distribution 3		5
Radios 1		5
Radios 2		5
Lightning		5
Total		30

I. Distribution (15 points)

Suppose that the distribution function $F(t) = P(X \leq t)$ of a discrete random variable X is:

$$F(t) = \begin{cases} 0 & \text{if } t < -1 \\ 1/8 & \text{if } -1 \leq t < -0.5 \\ 1/4 & \text{if } -0.5 \leq t < 1 \\ 1/2 & \text{if } 1 \leq t < 2.3 \\ 3/4 & \text{if } 2.3 \leq t < 4 \\ 5/6 & \text{if } 4 \leq t < 6 \\ 1 & \text{if } 6 \leq t \end{cases}$$

1. (5 points) What is the probability function of X ?

2. (5 points) What is the probability $P(X > 0)$?

3. (5 points) Calculate $Var(X)$.

III. Lightning (5 points)

Suppose that people are struck by lightning in Canada at a Poisson rate of 2 per month. What is the probability that in 2004 there will be exactly three months (not necessarily consecutive!) in which nobody will be struck by lightning? (Assume that the number of occurrences is independent from month to month)