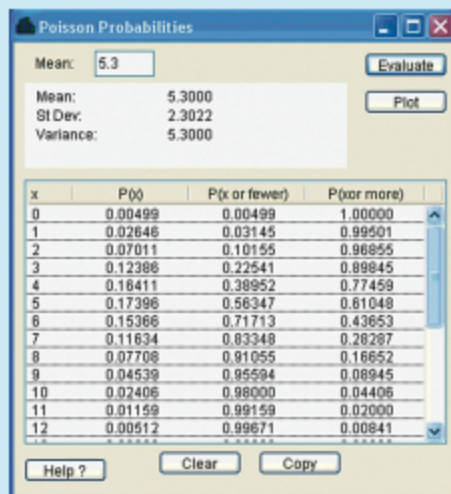


using TECHNOLOGY

STATDISK Select **Analysis** from the main menu bar, select **Probability Distributions**, then select **Poisson Distribution**. Enter the value of the mean. Click **Evaluate** and scroll for values that do not fit in the initial window. See the accompanying STATDISK display using the mean of 5.3 from Example 1 in this section.

STATDISK



x	P(x)	P(x or fewer)	P(x or more)
0	0.00499	0.00499	1.00000
1	0.02646	0.03145	0.99501
2	0.07011	0.10155	0.96855
3	0.12386	0.22541	0.89945
4	0.16411	0.38952	0.77459
5	0.17396	0.56347	0.61048
6	0.15366	0.71713	0.43653
7	0.11634	0.83349	0.28287
8	0.07708	0.91055	0.16652
9	0.04539	0.95594	0.08945
10	0.02406	0.98000	0.04406
11	0.01159	0.99159	0.02000
12	0.00512	0.99671	0.00841

MINITAB First enter the desired value of x in column C1. Now select **Calc** from the main menu bar, then select **Probability Distributions**, then **Poisson**. Enter the value of the mean and enter C1 for the input column.

EXCEL Click on **fx** on the main menu bar, then select the function category of **Statistical**. Select **POISSON** (or **POISSON.DIST**). Click **OK**. In the dialog box, enter the values for x and the mean, and enter 0 for "Cumulative." (Entering 1 for "Cumulative" results in the probability for values up to and including the entered value of x .)

TI-83/84 PLUS Press **2ND** **VARS** (to get **DISTR**), then select **poissonpdf**(. Now press **ENTER**, then proceed to enter μ , x (including the comma). For μ , enter the value of the mean; for x , enter the desired number of occurrences over an interval.

STATCRUNCH Click on **Open StatCrunch**, then click on **Stat**. Select **Calculators**, then select **Poisson**.

5-5 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

1. Notation In analyzing hits by V-1 buzz bombs in World War II, South London was partitioned into 576 regions, each with an area of 0.25 km^2 . A total of 535 bombs hit the combined area of 576 regions. Assume that we want to find the probability that a randomly selected region had exactly two hits. In applying Formula 5-9, identify the values of μ , x , and e . Also, briefly describe what each of those symbols represents.

2. Tornadoes During a recent 46-year period, New York State had a total of 194 tornadoes that measured 1 or greater on the Fujita scale. Let the random variable x represent the number of such tornadoes to hit New York State in one year, and assume that it has a Poisson distribution. What is the mean number of such New York tornadoes in one year? What is the standard deviation? What is the variance?

3. Poisson Approximation to Binomial Assume that we want to find the probability of getting at least one win when playing the Texas Pick 3 lottery 50 times. For one bet, there is a $1/1000$ probability of winning. If we want to use the Poisson distribution as an approximation to the binomial, are the requirements satisfied? Why or why not?

4. Poisson Approximation to Binomial Assume that we plan to play the Texas Pick 3 lottery 100 times. For one bet, there is a $1/1000$ probability of winning. If we want to use the Poisson distribution as an approximation to the binomial, are the requirements satisfied? If we use the Poisson distribution to find the probability of 101 wins, we get an extremely small positive number, so is it correct to conclude that the probability of 101 wins is possible, but highly unlikely?