The actual results consisted of these frequencies: 0 deaths (in 144 corps-years);1 death (in 91 corps-years); 2 deaths (in 32 corps-years); 3 deaths (in 11 corps-years); 4 deaths (in 2 corps-years). Compare the actual results to those expected by using the Poisson probabilities. Does the Poisson distribution serve as a good tool for predicting the actual results?

13. World War II Bombs In Exercise 1 we noted that 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.

a. Find the probability that a randomly selected region had exactly 2 hits.

b. Among the 576 regions, find the expected number of regions with exactly 2 hits.

c. How does the result from part (b) compare to this actual result: There were 93 regions that had exactly 2 hits?

14. Disease Cluster Neuroblastoma, a rare form of malignant tumor, occurs in 11 children in a million, so its probability is 0.000011. Four cases of neuroblastoma occurred in Oak Park, Illinois, which had 12,429 children.

a. Assuming that neuroblastoma occurs as usual, find the mean number of cases in groups of 12,429 children.

b. Using the unrounded mean from part (a), find the probability that the number of neuroblastoma cases in a group of 12,429 children is 0 or 1.

c. What is the probability of more than one case of neuroblastoma?

d. Does the cluster of four cases appear to be attributable to random chance? Why or why not?

15. Chocolate Chip Cookies In the production of chocolate chip cookies, we can consider each cookie to be the specified interval unit required for a Poisson distribution, and we can consider the variable x to be the number of chocolate chips in a cookie. Table 3-1 is included with the Chapter Problem for Chapter 3, and it includes the numbers of chocolate chips in 34 different Keebler cookies. The Poisson distribution requires a value for μ, so use 30.4, which is the mean number of chocolate chips in the 34 Keebler cookies. Assume that the Poisson distribution applies.

a. Find the probability that a cookie will have 26 chocolate chips, then find the expected number of cookies with 26 chocolate chips among 34 different Keebler cookies, then compare the result to the actual number of Keebler cookies with 26 chocolate chips.

b. Find the probability that a cookie will have 30 chocolate chips, then find the expected number of cookies with 30 chocolate chips among 34 different Keebler cookies, then compare the result to the actual number of Keebler cookies with 30 chocolate chips.

16. Chocolate Chip Cookies Consider an individual chocolate chip cookie to be the specified interval unit required for a Poisson distribution, and consider the variable x to be the number of chocolate chips in a cookie. Table 3-1 is included with the Chapter Problem for Chapter 3, and it includes the numbers of chocolate chips in 40 different reduced fat Chips Ahoy cookies. The Poisson distribution requires a value for μ, so use 19.6, which is the mean number of chocolate chips in the 40 reduced fat Chips Ahoy cookies. Assume that the Poisson distribution applies.

a. Find the probability that a cookie will have 18 chocolate chips, then find the expected number of cookies with 18 chocolate chips among 40 different reduced fat Chips Ahoy