

1. When assembling a steering mechanism for a Formula SAE race car, a mechanical engineering student must put nuts onto four bolts. They start threading the nuts by hand, and the probability of successfully threading on each attempt is 0.72. What is the probability that it will take them 7 attempts to get all four nuts threaded?
2. The probability that a solar panel is not functional a year after installation is 0.07. What is the probability that exactly 5 panels in an array of 1000 will not be functional one year after the array is installed?
3. The mechanical engineering student from Exercise 1 is selecting nuts from a box of assorted sizes. The box contains 27 nuts, of which 11 are the size needed. If she pulls out eight nuts, what is the probability that exactly four of them are the right size?

4. Workers on an assembly line are assembling strings of ten Christmas lights with randomly selected light bulbs. The probability of selecting a red bulb is 0.25 . When searching through such strings of lights at the store, what is the probability that you will go through nine strings before finding two strings with exactly four red lights?

5. For the scenario from the previous exercise, how many red lights would you expect a randomly selected string of lights to have?