

**STAT 100 SUMMER II 2000 (PROFESSOR GREEN)**  
**SOLUTIONS TO ASSIGNED PROBLEMS DUE**  
**AUGUST 1**

Problem 52.

- (a) The probability that no flare lights is  $.02^3 = .000008$  consequently, the probability of the complementary event, that at least one flare lights, is  $.999992$ .
- (b) The probability that exactly two flairs will light is  $\binom{3}{2} \times .98^2 \times .02 = .0576$ .

Problem 54. Let  $p$  be the probability of success. The information given tells us that  $p^3 = .064$ . It follows that  $p = .4$ , so that the probability of failure is  $.6$ , and the probability of three failures in three attempts is  $.6^3 = .216$ .

Problem 56.

- (a)  $.3^2 = .09$ .
- (b)  $.3^3 = .027$ .

Problem 58.

- (a)  $p = .25$ ; the desired probability is  $.75^4 = .3164$ .
- (b)  $p = \frac{16}{52} = .3077$ ; the desired probability is  $(1 - .3077)^4 = .2297$ .
- (c) For males, the probability of having the allergy is  $.3077$  as already computed. For females, it is  $\frac{9}{48} = .1875$ . The event desired is the intersection of four independent events, two with probability  $1 - .3077 = .6923$ , and two with probability  $1 - .1875 = .8125$ . The probability of the intersection is therefore  $.6923^2 \times .8125^2 = .3164$ .

So far as I have been able to determine, the identity of the answers to parts (a) and (c) ( and they *are* identical, not merely in agreement to four decimal places) is a coincidence.