

Stat 107 – Homework 1

Due back during tutorials on Wednesday, October 15

(If you cannot attend the tutorials please return during class on Wednesday 10/15)

Problem 1 [10 points]

A boy has 100 firecrackers in a box and only one of them is not defective. He tries each firecracker at random discarding those that do not work.

a) [5 points] What is the probability that the good one will be the 50th one he tries?

b) [5 points] Calculate the same probability assuming that he does not discard the defective ones and he puts them back in the box instead.

Problem 2 [10 points]

If 6 married couples are sitting at random in a row at the theatre find the probability that no husband sits next to his wife.

Problem 3 [10 points]

Suppose that each child born in a family is equally likely to be a boy or a girl. For a couple having 5 children, compute the probabilities of the following events:

i) [2 points] All children are of the same sex.

ii) [2 points] The 3 eldest are boys and the others girls.

iii) [2 points] Exactly three are boys.

iv) [2 points] The 2 oldest are boys.

v) [2 points] Knowing that the family has exactly three boys what is the probability that the oldest child is a girl?