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Review Problem

3 computer boards in a set of 40 are defective. 5 are chosen to be checked for defects.

What is the probability that a randomly chosen sample of 5 contains at least one defective board?

Solution

The number of different samples that can be chosen is

(40 / 5) = 40!/5! \* 35! = 658,008

(40 / 5) is the total number of possible samples. Since 3 are defective 37 won’t be.

So ( 37 / 5) = samples that don’t contain a defective board

= (total samples) – (samples that don’t contain a defective board)

= (40!/5!) – (37!/5!)

= 222,111

Let E be the event that a randomly chosen sample contains a defective board

Therefore N(E) = 222,111

Let S be the sample space that contains all possible samples of 5

Therefore N(S) = (40!/5!)

Therefore P(E) = N(E)/N(S)

= 222,111/ (40!/5!)

= 0.3376

33.76%