SOLUTION TO THE QUESTION FOR MATH 343 FOR THE LECTURE OF 16 APRIL

Problem 1. Suppose that 20% of all personal computers of a particular brand break down in their first year of operation. In an office with 10 such computers, what is the probability that at least one breaks down in its first year of operation?

Solution. The probability that a personal computers of this brand does not break down in its first year of operation is 0.8. Therefore the probability that 10 of them do not break down is

$$(0.8)^{10} = 0.1073741824 \approx 0.107.$$

So the probability that at least one breaks down is

$$1 - (0.8)^{10} = 1 - 0.1073741824 = 0.8926258176 \approx 0.893,$$

or about 89%. □

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