

Neuroscience Center Zurich

University of Zurich

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Exercises for chapter 1 (more in course)

In Class: 1

Homework; to hand in until Monday evening 2359: 2, 3, 6, 9

Additional Homework; not to be hand in: 4, 5, 7, 8

1. What is

$$\binom{n}{k}$$

Compute

$$\binom{10}{3}$$

and now

$$\binom{10}{7}$$

2. How many guest are present if pairs of two shake hands 253 times (assume all shake hand with everybody once).

3. Probability for 40 y old man to die in next y is 0.002. 20 men of age 40 meet. How high is the probability that at least one of the 20 dies in the coming y?

4. Events A, B and C . Show:

$$P[A \cap B \cap C] = P[A]P[B|A]P[C|A \cap B].$$

5. Looking at families with 3 children, how high is the probability that we choose a family with 2 girls and 1 boy if we choose randomly with equal probabilities amongst families with 3 children?

6. There are 6 red, 4 green and 2 yellow balls in a box. You take two out of the box randomly. What is the probability that the 2 balls have the same color?
7. Playing Monopoly with pair of dice (red and blue). C is the event that red comes up "1", D is the event that blue comes up "2". Show that C and D are independent of each other. Independence means: $P[C]P[D] = P[C \cap D]$.
8. Playing Monopoly with pair of dice (red and blue). C is the event that red comes up "1", D is the event the sum is 3. Show that C and D are not independent of each other.
9. Given there are 300 students in a class. 200 are studying biology, 80 geography and 20 an other subject. You select a person randomly. How high is the probability that this person is studying biology and is born on a Sunday?

Homework: