

Probability - part 2

date: , class: , student:

1 Exercises

- **Exercise 1:** You flip 3 *fair* coins: are the events of finding 3 “heads” and of finding 1 “tails” *mutually exclusive*? what is the probability of finding 3 “heads” or 1 “tails”?
- **Exercise 2:** You do the same experiment as in the previous exercise but using 4 coins: does anything change? Why?
- **Exercise 3:** What is the probability of scoring at least 3 when throwing 2 fair dice?
- **Exercise 4:** What is the probability of scoring less than 10 when throwing 2 fair dice?
- **Exercise 5:** What is the probability of getting 3 “heads” or 1 “tails” when flipping 4 fair coins?
- **Exercise 6:** What is the probability of getting an odd number or a number smaller than 4 when throwing a fair dice?
- **Exercise 7:** What is the probability of scoring at least 5 or less than 3 when throwing 2 fair dices? What is instead the probability of scoring at least 5 or at least 3?
- **Exercise 8:** What is the probability of not getting 3 “heads” or 1 “tails” when flipping 5 fair coins? (use combinations to count the number of favorable outcomes)
- **Exercise 9:** A box contains three red balls and two blue balls. We extract two balls one at a time.

What is the probability of the event “to extract one red ball and one blue ball, no matter in what order”. Verify that this coincides with the probability of the intersection of “to extract a red ball” and “to extract a blue ball”

What is the probability of the event “to extract a red ball the first time, or a blue ball the second time”. Verify that this event coincides with

the probability of the union of “to extract a red ball the first time” or “to extract a blue ball the second time”.

- **Exercise 10:** We repeat the same experiment but this time after extracting a ball we put it back into the box. How do the probabilities change?

2 Useful links

- Khan Academy: addition rule for probability explained through Venn diagrams.
<https://goo.gl/f5UZE5>

Glossary

- fair = (in questo contesto) non truccato
- heads/tails = testa/croce
- mutually exclusive = incompatibili