

AP Statistics – Probability Notes

Law of Large Numbers:

The long-run relative frequency of repeated independent events approaches the TRUE probability of that event.

Law of Averages: what gets people in trouble at casinos (this “law” does not actually exist).

Position	feet	snout	back	side (dot)	side (no dot)	ear-snout	leaning back
Probability							

Ex 1. **Rolling Pigs.** Find each of the following probabilities (round to 4 decimal places if necessary).

1. If we roll one pig, what is the probability that it does NOT land on its feet?
2. If we roll one pig, what is the probability of rolling a “snout” OR “side (dot)”? (**ADDITION RULE**)
3. If we roll two pigs, what is the probability of rolling a “snout” AND then a “side (dot)”? (**MULT. RULE**)
4. If we roll a pig twice, what is the probability that it lands on “back” both times OR “side (no dot)” both times?*
5. What is the probability of rolling “back” four times in a row?
6. If we roll a pig 4 times, what is the probability that it never lands on its back?
7. If we roll a pig 4 times, what is the probability that it lands on its back **AT LEAST ONCE**?*

Ex 2. **Red-green colorblindness** is a condition that affects about 6% of the male population. For this problem, assume that the probability that a randomly selected male is red-green colorblind is exactly 0.06.
Find each probability:

1. That a randomly selected male is **not** colorblind.
2. Two people (both male) are chosen at random; both are colorblind.
3. Two males are chosen at random; the first **is** colorblind and the 2nd **is not**.
4. In an AP Statistics class, there are 12 males; **none** of the males students are colorblind.
5. In the same class, **at least one** male student is colorblind.*

Ex 3. **The 8th grader problem** An algebra II class has 5 ninth-graders, 17 sophomores, and 3 eighth graders.

1. If you select one student at random, what is the probability that you will select an 8th grader?
2. If you select a group of 3 students from this class, what is the probability that you pick only freshmen?
3. If you select two students at random from this class, what is the probability that both are ninth-graders OR both are sophomores?