

# Assignment 5 (NCERT Class 9 Probability)

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**Abstract**—This document contains the solution to Question 2 of Exercise 15.1 of Chapter 15 (Probability) in the NCERT Class 9 Exemplar.

**Exercise 15.1, Q2.** 1500 families with 2 children were selected randomly, and the following data were recorded:

<b>Number of girls in a family</b>	2	1	0
<b>Number of families</b>	475	814	211

TABLE I: Number of girl children in families

Compute the probability of a family, chosen at random, having

- (i) 2 girls
- (ii) 1 girl
- (iii) No girl

Also, check whether the sum of these probabilities is 1.

**Solution:** Denote the outcome of the experiment by a random variable  $X \in \{0, 1, 2\}$ , where  $X = i$  denotes that the chosen family has  $i$  girls,  $i \in \{0, 1, 2\}$ . Then (to 3 d.p.),

$$\Pr(X = 0) = \frac{211}{1500} = 0.140 \quad (1)$$

$$\Pr(X = 1) = \frac{814}{1500} = 0.543 \quad (2)$$

$$\Pr(X = 2) = \frac{475}{1500} = 0.317 \quad (3)$$

One can also verify that since these events are mutually exclusive and exhaustive, we get  $\Pr(X = 0) + \Pr(X = 1) + \Pr(X = 2) = 0.140 + 0.543 + 0.317 = 1$ . The Python code `./codes/5_1.py` computes said probabilities after generating random samples, verifying that their sum is 1 (in the limit of float precision).