

Assignment 8 (NCERT Class 12)

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Abstract—This document contains the solution to Question 16 of Exercise 13.2 in Chapter 13 (Probability) of the NCERT Class 12 Mathematics Textbook.

Exercise 13.2, Q16. In a hostel, 60% of the students read Hindi newspaper, 40% read English newspaper and 20% read both Hindi and English newspapers. A student is selected at random.

- Find the probability that she reads neither Hindi nor English newspapers.
- If she reads Hindi newspaper, find the probability that she reads English newspaper.
- If she reads English newspaper, find the probability that she reads Hindi newspaper.

Solution: Let E be the event that the student reads the English newspaper and F be the event that the student reads the Hindi newspaper. Then, we are given that

$$\Pr(E) = 0.4 \quad (1)$$

$$\Pr(F) = 0.6 \quad (2)$$

$$\Pr(EF) = 0.2 \quad (3)$$

For any event X , we may write,

$$\Pr(X') = 1 - \Pr(X) \quad (4)$$

So, using De-Morgan's Laws,

$$\Pr(E' + F') = \Pr((EF)') \quad (5)$$

$$= 1 - \Pr(EF) \quad (6)$$

$$= 1 - 0.2 = \frac{4}{5} \quad (7)$$

We also have the following:

$$\Pr(E|F) = \frac{\Pr(EF)}{\Pr(F)} = \frac{0.2}{0.6} = \frac{1}{3} \quad (8)$$

$$\Pr(F|E) = \frac{\Pr(EF)}{\Pr(E)} = \frac{0.2}{0.4} = \frac{1}{2} \quad (9)$$

The answers are verified in codes/8_1.c.