

CBSE Test Paper 02

CH-15 Probability

1. A bag contains 5 red balls and some blue balls. The probability of drawing a blue ball is double that of a red ball. The number of blue balls in the bag is
 - a. 10
 - b. 30
 - c. 5
 - d. 20

2. Weather forecast from a news channel was correct 125 times out of 365 days. The probability that on a given day it was not correct is
 - a. $\frac{25}{73}$
 - b. $\frac{16}{73}$
 - c. $\frac{48}{73}$
 - d. $\frac{5}{73}$

3. One card is drawn from a well-shuffled deck of 52 cards. The probability of drawing an ace is
 - a. $\frac{1}{26}$
 - b. $\frac{1}{52}$
 - c. $\frac{1}{13}$
 - d. $\frac{4}{13}$

4. A die is thrown once. The probability of getting a number 3 or 4 is
 - a. 0

b. $\frac{2}{3}$

c. $\frac{1}{3}$

d. 1

5. A die is thrown 300 times and odd numbers are obtained 153 times. Then, the probability of getting an even number is

a. $\frac{147}{300}$

b. $\frac{147}{153}$

c. $\frac{153}{300}$

d. $\frac{174}{300}$

6. Fill in the blanks:

$P(E) + P(\text{not } E)$ is equal to _____.

7. Fill in the blanks:

If probability of an event say A is 1, i.e. $P(A) = 1$, then event A is called a certain event or _____.

8. A die is thrown. What is the probability of getting a multiple of 3 on the upper face?

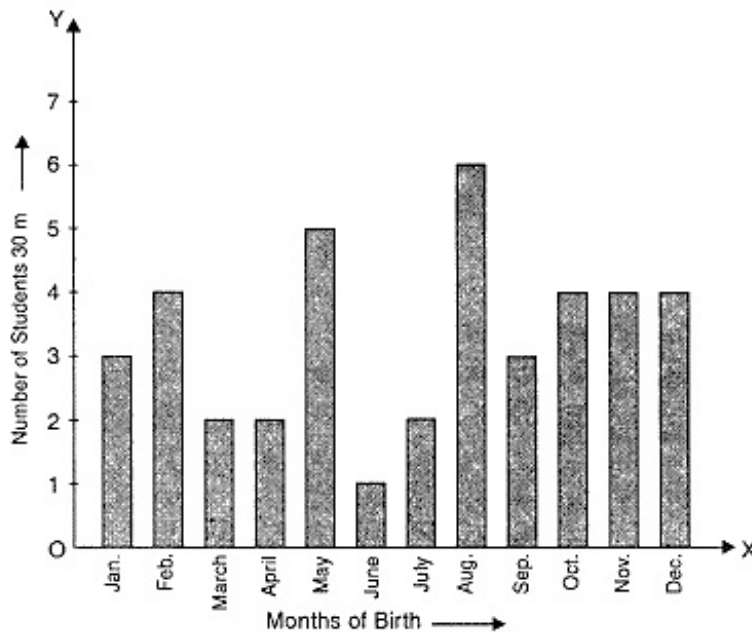
9. Can the experimental probability of an event be a negative number? If not, why?

10. The record of a weather station shows that out of the past 250 consecutive days, its weather forecast was correct 175 times. What is the probability that on a given day,

i. it was correct?

ii. it was not correct?

11. In a particular section of Class IX, 40 students were asked about the months of their birth, the following graph was prepared for the data so obtained.



Find the probability that a student of the class was born in August.

12. A die was rolled 200 times and the number of times 6 came up was noted. If the experimental probability calculated from this information is $\frac{2}{5}$, then how many times 6 came up?
13. 1500 families with 2 children were selected randomly and the following data were recorded:

No. of girls in a family	No. of families
2	475
1	814
0	211

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

14.

Marks (out of 100)	Number of Students

0-20	7
20-30	10
30-40	10
40-50	20
50-60	20
60-70	15
70-above	8
Total	90

- i. Find the probability that a student obtained less than 20% in the mathematics test.
- ii. Find the probability that a student obtained marks 60 or above.

15. The percentage of marks obtained by a student in the monthly unit tests are given below:

Unit test	I	II	III	IV	V
Percentage of marks obtained	58	74	76	62	85

Find the probability that the student gets:

- i. a first-class i.e. at least 60% marks
- ii. marks between 70% and 80%
- iii. a distinction i.e. 75% or above
- iv. less than 65% marks

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Solution

1. (a) 10

Explanation: Let number of blue balls be b Total number of balls = $5 + b$ Probability of picking a red ball, $P(R) = \frac{5}{5+b}$ Probability of picking a blue ball, $P(B) = \frac{b}{5+b}$ Given, $P(B) = 2 \times P(R)$ Therefore, $\frac{b}{5+b} = 2 \left\{ \frac{5}{5+b} \right\}$ Therefore, $b = 10$ Number of blue balls in the bag = 10

2. (c) $\frac{48}{73}$

Explanation: Number of days = 365 Number of times the weather forecast was correct = 125 Number of times the weather forecast was not correct = $365 - 125 = 240$ The probability that on a given day it was not correct = $240 / 365 = 48 / 73$

3. (c) $\frac{1}{13}$

Explanation: In a deck of playing cards, there are 52 cards. Therefore, the total number of possible outcomes = 52 Total number of aces = 4 Number of favourable outcomes = 4 The probability of drawing an ace = $\frac{4}{52} = \frac{1}{13}$

4. (c) $\frac{1}{3}$

Explanation: Number of possible outcomes = 6 Possibility of getting 3 or 4 = 2 Probability of getting a number 3 or 4 = $2 / 6 = 1 / 3$

5. (a) $\frac{147}{300}$

Explanation: Number of times the die is rolled = 300 Number of times odd numbers are obtained = 153 Number of times even numbers are obtained = $300 - 153 = 147$ The probability of getting an even number = $147/300$

6. 1

7. sure event

8. Multiples of 3 on a die = 3, 6

$$\therefore \text{Probability (p (a multiple of 3))} = \frac{2}{6} = \frac{1}{3}$$

9. The experimental probability of an event cannot be a negative number since the number of trials in which the event can happen cannot be negative, and the number of trials is always positive.

10. i. The probability that the forecast was correct on a given day

$$= \frac{\text{Number of days for which the forecast was correct}}{\text{Number of days for which the forecast was made}}$$

$$= \frac{175}{250} = 0.7$$

ii. The probability that the forecast was not correct on a given day

$$= \frac{\text{Number of days for which the forecast was not correct}}{\text{Number of days for which the forecast was made}}$$

$$= \frac{250-175}{250} = \frac{75}{250} = 0.3$$

11. Total number of students born in the year = $3 + 4 + 2 + 2 + 5 + 1 + 2 + 6 + 3 + 4 + 4 + 4 = 40$

Number of students born in August = 6

$\therefore$ Probability that a student of the class was born in August

$$= \frac{6}{40} = \frac{3}{20}.$$

12. A die was rolled 200 times.

Let 6 came up x times.

$$\text{Probability of getting 6} = \frac{2}{5}$$

$$\text{Now, probability of an event} = \frac{\text{Frequency of the event occurring}}{\text{Total number of trials}}$$

$$\Rightarrow \frac{2}{5} = \frac{x}{200}$$

$$\Rightarrow x = \frac{400}{5} = 80$$

13. (i) Total number of families = 1500

No. of families having 2 girls = 475

$$\therefore P(\text{Family having 2 girls}) = \frac{475}{1500} = \frac{19}{60}$$

(ii) No of families having 1 girl = 814

$$\therefore P(\text{Family having 1 girl}) = \frac{814}{1500} = \frac{407}{750}$$

(iii) No. of families having no girl = 211

$$\therefore P(\text{Family having no girl}) = \frac{211}{1500}$$

$$\text{Checking: Sum of all probabilities} = \frac{19}{60} + \frac{407}{750} + \frac{211}{1500}$$

$$= \frac{475+814+211}{1500} = \frac{1500}{1500} = 1$$

Yes, the sum of all three probabilities is 1.

14. i. Number of students obtaining less than 20%

in the mathematics test = 7

$\therefore$ Probability that a student obtained less than 20%

$$\text{in the mathematics} = \frac{7}{90}$$

ii. Number of students obtaining marks 60 or above = $15 + 8 = 23$

$$\therefore \text{Probability that a student obtained marks 60 or above} = \frac{23}{90}.$$

15. Total number of unit tests held = 5

i. Number of unit tests in which the student gets a first class i.e. at least 60% marks = 4

$\therefore$ Probability that the student gets a first class = $\frac{4}{5} = 0.8$

ii. Number of tests in which the student gets marks between 70% and 80% = 2

$\therefore$ Probability that a student gets marks between 70% and 80% = $\frac{2}{5} = 0.4$

iii. Number of tests in which the student gets distinction = 2

$\therefore$ Probability that the student gets distinction = $\frac{2}{5} = 0.4$

iv. Number of tests in which the student gets less than 65% marks = 2

$\therefore$ Probability that a student gets less than 65% marks = $\frac{2}{5} = 0.4$