

# Probability

1. **Assertion:** The probability of getting a face card from a well shuffled deck of 52 cards is  $\frac{3}{13}$ .

**Reason:** The probability of getting at most one head when two coins are tossed simultaneously is  $\frac{1}{3}$ .

- a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
- b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- c) Assertion (A) is true, but Reason (R) is false.
- d) Assertion (A) is false, but Reason (R) is true.

**Answer:** (c) Assertion (A) is true, but Reason (R) is false.

**Reason:** The probability of getting atmost one head when two coins are tossed simultaneously is  $\frac{3}{4}$ .

2. **Assertion:** Card numbered as 5, 6, 7,.....,15 are put in a box and mixed thoroughly, one card is then drawn at random. The probability of drawing a prime number is  $\frac{3}{10}$ .

**Reason:** For any event E, we have  $0 \leq P(E) \leq 1$ .

- a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
- b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- c) Assertion (A) is true, but Reason (R) is false.
- d) Assertion (A) is false, but Reason (R) is true.

**Answer:** (d) Assertion (A) is false, but Reason (R) is true

$$P(\text{drawing a prime number}) = \frac{4}{11}$$

3. **Assertion(A):** A fair die is thrown once. The probability of getting a composite number is  $\frac{1}{3}$ . **Reason(R):** A natural number is a composite number if it has more than 2 factors.

**Answer: (c)-** Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

4. **Assertion(A):** The probability of randomly drawing a card with a number not divisible by 3 from a box containing cards numbered 1 to 30 is  $\frac{2}{3}$ .

**Reason(R) :** Probability of an event = 
$$\frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}$$

	<p><b>Answer: (a)</b> - Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).</p>																
5.	<p><b>Assertion:</b> The probability of losing a game is 0.29. Then the probability of winning it is 0.71 .</p> <p><b>Reason:</b> <math>P(\bar{E}) = 1 - P(E)</math> where <math>E</math> is any event.</p> <p><b>Answer:</b> A) Both assertion and reason are true and reason is the correct explanation of assertion.</p>																
6.	<p>A healthy environment is very essential for the survival of all living things. Forests, rivers, oceans, and soil are the vital components of our environment. In order to promote the wellbeing of all living creatures we should safeguard our environment by planting trees, preventing pollution, soil erosion etc Creating awareness about the environment prepares a child to understand and take necessary steps to protect the environment.</p> <p>A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality.</p> <table border="1" data-bbox="193 779 1406 967"> <tr> <td>Number of plants</td> <td>0-2</td> <td>3-5</td> <td>6-8</td> <td>9-11</td> <td>12-14</td> <td>15-17</td> <td>18-20</td> </tr> <tr> <td>Number of houses</td> <td>1</td> <td>2</td> <td>1</td> <td>5</td> <td>6</td> <td>2</td> <td>3</td> </tr> </table> <p>a) Find the probability that the house chosen at random has more than 8 plants.</p> <p>b) Find the probability that the house chosen at random has not more than 5 plants.</p> <p style="text-align: center;">OR</p> <p>Find the probability that the house chosen at random has 14 or fewer plants.</p> <p>c) Find the probability that the house chosen at random has 2 or less than 2 plants.</p> <p><b>Answers:</b></p> <p>a) <math>\frac{16}{20}</math>  b) <math>\frac{3}{20}</math>      b) <math>\frac{15}{20}</math>  c) <math>\frac{1}{20}</math></p>	Number of plants	0-2	3-5	6-8	9-11	12-14	15-17	18-20	Number of houses	1	2	1	5	6	2	3
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Number of houses	1	2	1	5	6	2	3										
7.	<p>Two unbiased dice are thrown once. The probability that the number appearing on the first die is double that on the second die is</p> <p>A) <math>\frac{5}{36}</math>      B) <math>\frac{1}{18}</math>      C) <math>\frac{1}{12}</math>      D) <math>\frac{1}{6}</math></p> <p>Answer: (c)</p>																
8.	<p>Two unbiased dice are thrown once. The probability that the sum of numbers appearing on the top faces of the dice is less than or equal to 12 is</p> <p>A) <math>\frac{1}{36}</math>      B) 1      C) <math>\frac{1}{3}</math>      D) 0</p> <p>Answer: b) 1</p>																

9. A standard deck of cards has four suites, hearts, clubs, spades and diamonds. Each suite has thirteen cards each making the total number of cards in the deck as 52.



Based on the above information, answer the following questions :

- (i) A card is drawn at random from a well shuffled deck of playing cards. What is the probability of getting a face card?
- (ii) What is the probability that the card drawn is a jack or an ace?
- (iii) Find the probability of getting a diamond or a queen.

OR

Find the probability of getting a king or a black card.

Answer:

$$\begin{array}{l} \text{(i)} \quad \frac{12}{52} = \frac{3}{13} \\ \text{(ii)} \quad \frac{8}{52} = \frac{2}{13} \\ \text{(iii)} \quad \frac{16}{52} = \frac{4}{13} \quad \text{OR} \quad \frac{28}{52} = \frac{7}{13} \end{array}$$