



MATHS

BOOKS - OMEGA PUBLICATION

PROBABILITY

Question

1. Describe the sample space for the indicated experiment,
A coin is tossed three times.



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2. 2 boys and 2 girls are in room X, and 1 boy and 3 girls in room Y. Specify the sample space for the experiment in which a room is selected and then a person.



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3. A box contains 1 red and 3 identical white balls. Two balls are drawn at random in succession (one after the other) without replacement. Write the sample space for this experiment.



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4. An experiment consists of tossing a coin and then throwing it second time if a head occurs. If a tail occurs on the first toss, then a die is rolled once. Find the sample space.

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5. Suppose 3 bulbs are selected at random from a lot. Each bulb is tested and classified as defective (D) or non-defective (N). Write the sample space of this experiment.

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6. A coin is tossed. If the outcome is a head, a die is thrown. If the die shows up an even number, the die is thrown again. What is the sample space for the experiment?

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7. A die is thrown repeatedly until a six comes up. What is the sample space for the this experiment?

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8. A die is rolled. Let E be the event "die shows 4" and F be the event "die shows even number". Are E and F mutually

exclusive ?



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9. A die is thrown. Describe the following events :

(i) A : a number less than 7.

(ii) B : a number greater than 7.

(iii) C : a multiple of 3.

(iv) D : a number, less than 4.

(v) E : an even number greater than 4.

(vi) F : a number not less than 3.



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10. Three coins are tossed once. Let A denote the event "three heads show", B denote the event "two heads and one tail show", C denote the event "three tails show and D denote the event "a head shows on the first coin".

Which events are

(i) mutually exclusive ? (ii) in simple ? (iii) compound ?



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11. Two dice are thrown. The events A, B, C are as follows:

A: getting an even number on the first die.

B : getting an odd number on the first die.

C : getting the sum of the number on the dice ≤ 5 .

Describe the events

(i) A' (ii) not B (iii) A or B (iv) A and B (v) A but not C (vi)

$$A \cap B' \cap C' = \phi.$$

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12. Which of the following can not valid assignments for outcomes of sample space,

$$S = \{\omega_1, \omega_2, \omega_3, \omega_4, \omega_5, \omega_6, \omega_7\}$$

Assignment	ω_1	ω_2	ω_3	ω_4	ω_5	ω_6	ω_7
(a)	0.1	0.01	0.05	0.03	0.01	0.2	0.6
(b)	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$
(c)	0.1	0.2	0.3	0.4	0.5	0.6	0.7
(d)	-0.1	0.2	0.3	0.4	-0.2	0.1	0.3

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13. A coin is tossed twice, what is the probability that atleast one tail occurs ?



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14. A die is thrown, find the probability of the following events

(i) A prime number will appear.

(ii) A number greater than or equal to 3 will appear.

(iii) A number more than 6 will appear.

(iv) A number less than 6 will appear.



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15. Find the probability that when a hand of 7 cards is drawn from a well shuffled deck of 52 cards it contains :

(i) all Kings (ii) exactly three Kings (iii) at least three Kings.



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16. A fair coin marked 1 on one face and 6 on the other and a fair die are both tossed. Find the probability that sum of numbers that turns up is

(i) 3 (ii) 12.



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17. There are four men and six women in the city council. If one council member is selected for a committee at random, how likely is it that it is a woman ?



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18. Three coins are tossed once. Find the probability of getting

(i) 2 heads

(ii) at least 2 heads

(iii) at most 2 heads

(iv) no head

(v) no tail

(vi) at most 2 tails.

(vii) exactly two tails

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19. A letter is chosen at random from the word ASSASSINATION. Find the probability that a letter is

(i) vowel.

(ii) a consonant.

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20. In a lottery, a person chosen six different natural numbers at random from 1 to 20, and if these six numbers match with the six numbers already fixed by the lottery

committee he wins prize. What is the probability of winning the prize in the game ?

[Provided that the order of the number is not important].

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21. Given $P(A) = \frac{3}{5}$ and $P(B) = \frac{1}{5}$, find $P(A \text{ or } B)$ and A & B are mutually exclusive events.

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22. If E and F are events such that $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$. Find

(i) $P(E \text{ or } F)$ (ii) $P(\text{not } E \text{ and not } F)$.

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23. In class XI of a school 40% of the students study Mathematics and 30% study Biology 10% of the class study both Mathematics and Biology. If a student is selected at random from the class, find the probability that he will be studying Mathematics or Biology.



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24. Two students Anil and Ashima appeared in an examination. The probabilities that Anil will qualify the examination is 0.05 and that Ashima will qualify the examination is 0.10. The probabilities that both will qualify the examination is 0.02. Find the probability that

a) Both Anil and Ashima will not qualify the examination.

b) Atleast one of them will not qualify the examination.

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25. In an entrance test that is graded on the basis of two examinations, the probability of a randomly chosen student passing the first-examination is 0.8 and the probability of passing the second examination is 0.7. The probability of passing at least one of them is 0.95. What is the probability of passing both ?

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Important Questions From Miscellaneous Exercise

1. A bag contains 9 discs of which 4 are red, 3 are blue and 2 are yellow. The discs are similar in shape and size. A disc is drawn at random from the bag. Calculate the probability that it will be

(i) red (ii) yellow (iii) blue (iv) not blue (v) either red or yellow.



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2. 4 cards are drawn from a well shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade ?



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3. One card is drawn from a well shuffled deck of 52 cards.

If each outcome is equally likely, calculate the probability

that card drawn is :

i) not an ace

ii) a black card

ii) not a black card

iv) a diamond

v) not a diamond.



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4. Out of 100 students, two sections of 40 and 60 are formed. If you and your friend are among 100 students, what is the probability that

a) you both enter the same section.

b) you both enter the different sections.

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5. Three letters are dictated to three persons and an envelope is addressed to each of them the letters are inserted into the envelopes at random so that each envelope contains exactly one letter. Find the probability that at least one letter is in its proper envelope.

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6. If 4-digit numbers greater than 5000 are randomly formed from the digits 0, 1, 3, 5 and 7 what is the

probability of forming a number divisible by 5 when,

i) the digits are repeated ?

ii) the repetition of digits is not allowed ?



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7. A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If a die is rolled once determine.

(i) $P(2)$

(ii) $P(1 \text{ or } 3)$

(iii) $P(\text{not } 3)$



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Multiple Choice Questions Mcqs

1. A card is drawn from a pack of 100 cards numbered 1 to 100. The probability of drawing a number which is a square is.

A. $\frac{1}{5}$

B. $\frac{2}{5}$

C. $\frac{1}{10}$

D. none of these

Answer: C



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2. If A and B are events such that $P(A) = 0.42$, $P(B) = 0.48$ and $P(A \cap B) = 0.16$, then $P(A \text{ or } B)$ is equal to

A. 0.9

B. 0.74

C. 0.2016

D. none of these

Answer: B



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3. If two event A and B are independent, then

A.

$$P(A + B) = P(A) + P(B), P(AB) = P(A)P(B/A)$$

B.

$$P(A + B) \leq P(A) + P(B), P(AB) = P(A)P(B/A)$$

C.

$$P(A + B) \geq P(A) + P(B), P(AB) = P(A)P(B/A)$$

D. $P(A + B) \leq P(A) + P(B), P(AB) = P(A)P(B)$

Answer: D



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4. Two dice are thrown, the probability that the sum of the points on two dice will be 7 is

A. $\frac{5}{36}$

B. $\frac{6}{36}$

C. $\frac{7}{36}$

D. $\frac{8}{36}$

Answer: B



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5. The probability that a person will hit target in shooting practice is 0.3. If he shoots 10 times, then the probability of his shooting the target is

A. 1

B. $1 - (0.7)^{10}$

C. $(0.7)^{10}$

D. $(0.3)^{10}$

Answer: D



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6. A sample space consists of three mutually independent and equally likely events. The probability of happening of each one of them is equal to

A. 0

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

C. 1

D. none of these

Answer: B



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7. The chance of throwing a total of 3 or 5 or 11 with two dice is

A. $\frac{5}{36}$

B. $\frac{1}{9}$

C. $\frac{2}{9}$

D. $\frac{19}{36}$

Answer: C



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8. The probability that a non-leap year has 53 Sundays is

A. $\frac{1}{7}$

B. $\frac{2}{7}$

C. $\frac{3}{7}$

D. $\frac{4}{7}$

Answer: A



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9. Three identical dice are rolled. The probability that the same number will appear on each of them is

A. $\frac{1}{6}$

B. $\frac{1}{18}$

C. $\frac{1}{36}$

D. none of these

Answer: C



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10. From a well-shuffled pack of 52 cards, 2 cards are drawn, the first being replaced before the second is drawn. The probability that the first is a diamond and the second is queen is

A. $\frac{1}{52}$

B. $\frac{1}{26}$

C. $\frac{4}{13}$

D. $\frac{1}{4}$

Answer: A



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11. The number of elements in a sample space, when a die rolled twice are

A. 6

B. 18

C. 36

D. 72

Answer: C

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12. What is the probability of sure event ?

A. 0

B. 1

C. ϕ

D. S

Answer: B

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13. What will be the probability of an impossible event ? a.

0 b. 1 c. 2 d. 3

A. 0

B. 1

C. ϕ

D. S

Answer: A



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14. The number of elements in a sample space when a coin is tossed and a die is thrown are

A. 8

B. 12

C. 10

D. 14

Answer: B



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15. The number of elements in a sample space, when coin is tossed four times are

A. 8

B. 32

C. 16

D. 48

Answer: C



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