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Logic: Probability Word Problems

Exam — Probability

Pre-med style, no-calculator probability word problems (students, dice, coins, cards, balls) covering complements, conditional probability, independence, counting, expected value, Bayes/base-rate traps, and classic reasoning setups.

75 items — Printable Exam

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1 **A fair six-sided die is rolled once. What is the probability of getting an even number?**

A 1/6

B 1/3

C 1/2

D 2/3

E 5/6

2 **A fair six-sided die is rolled once. What is the probability of getting a number greater than 4 OR an even number?**

A 1/3

B 1/2

C 2/3

D 5/6

E 1

3 **Two fair dice are rolled. What is the probability that the sum is exactly 7?**

A 1/12

B 1/9

C 1/6

D 5/36

E 1/3

4 Two fair dice are rolled. What is the probability that the sum is at least 11?

A 1/6

B 1/12

C 1/9

D 1/18

E 1/3

5 Two fair dice are rolled. What is the probability that at least one die shows a 6?

A 1/6

B 5/36

C 11/36

D 1/2

E 25/36

6 Two fair dice are rolled. What is the probability of rolling a double (both dice show the same number)?

A 1/12

B 1/6

C 5/36

D 1/3

E 1/2

7 A fair coin is tossed twice. What is the probability of getting at least one head?

A 1/4

B 1/2

C 3/4

D 2/3

E 1

8 A fair coin is tossed twice. What is the probability of getting exactly one head?

A 1/4

B 1/2

C 3/4

D 1/3

E 2/3

9 A fair coin is tossed three times. What is the probability that all three tosses show the same face?

A 1/8

B 1/4

C 3/8

D 1/2

E 3/4

10 A fair coin is tossed three times. Given that the first toss was Head, what is the probability that there are exactly two heads in total?

A 1/4

B 1/2

C 3/4

D 1/8

E 2/3

11 A standard 52-card deck is shuffled. One card is drawn. What is the probability the card is a heart OR a king?

A 1/4

B 4/13

C 1/3

D 5/13

E 17/52

12 A standard 52-card deck is shuffled. One card is drawn. Given that the card is red, what is the probability it is a heart?

A 1/4

B 1/2

C 13/52

D 2/3

E 3/4

13 **A bag contains 3 red balls and 2 blue balls. Two balls are drawn WITHOUT replacement. What is the probability both are red?**

A 3/10

B 6/25

C 1/2

D 2/5

E 1/5

14 **A bag contains 3 red balls and 2 blue balls. Two balls are drawn WITHOUT replacement. Given that the first ball drawn was red, what is the probability the second ball is red?**

A 1/4

B 1/2

C 2/3

D 3/4

E 3/5

15 A bag contains 3 red balls and 2 blue balls. Two balls are drawn WITHOUT replacement. What is the probability of drawing at least one red ball?

A 1/10

B 3/10

C 9/10

D 4/5

E 2/5

16 A bag contains 2 red, 2 blue, and 1 green ball. Two balls are drawn WITHOUT replacement. What is the probability the two balls are different colors?

A 1/5

B 2/5

C 3/5

D 4/5

E 1/2

17 A bag contains 4 white balls and 1 black ball. A ball is drawn, its color noted, then replaced. A second ball is drawn. What is the probability both draws are black?

A 1/25

B 1/5

C 2/25

D 1/10

E 1/20

18 A bag contains 4 white balls and 1 black ball. Two balls are drawn WITHOUT replacement. What is the probability both draws are black?

A 0

B 1/25

C 1/5

D 1/10

E 4/25

19 A drawer contains 3 black socks and 3 white socks. Two socks are drawn at random WITHOUT replacement. What is the probability they are the same color?

A 1/5

B 2/5

C 1/3

D 1/2

E 3/5

20 A drawer contains 3 black socks and 3 white socks. Two socks are drawn WITHOUT replacement. Given that the socks are the same color, what is the probability they are both black?

A 1/3

B 1/2

C 2/5

D 3/5

E 2/3

21 **A class has 10 students: 6 girls and 4 boys. Two students are chosen at random WITHOUT replacement. What is the probability both are girls?**

A 1/3

B 2/5

C 1/2

D 4/9

E 3/10

22 **A class has 10 students: 6 girls and 4 boys. Two students are chosen at random WITHOUT replacement. What is the probability at least one is a girl?**

A 2/15

B 13/15

C 1/3

D 4/5

E 11/15

23 **A class has 10 students: 6 girls and 4 boys. Two students are chosen at random WITHOUT replacement. What is the probability exactly one is a girl?**

A 8/15

B 1/3

C 2/3

D 7/15

E 4/15

24 **A teacher randomly selects 3 students from a class of 8 (all groups of 3 equally likely). What is the probability that Alex is selected?**

A 1/8

B 3/8

C 5/8

D 3/5

E 1/3

25 **From 5 students, two are chosen at random to represent the class. What is the probability that both Alice and Bob are chosen?**

A 1/10

B 2/5

C 1/5

D 1/4

E 1/2

26 From 6 students, a committee of 3 is chosen. What is the probability that exactly one of the two students A and B is on the committee?

A 3/5

B 2/5

C 1/2

D 3/10

E 4/5

27 Four students A, B, C, D sit in a row in random order. What is the probability that A and B sit next to each other?

A 1/3

B 1/2

C 2/3

D 1/4

E 3/4

28 Five students sit in a row in random order. What is the probability that student A sits at one of the two ends?

A 1/5

B 2/5

C 3/5

D 1/2

E 2/3

29 Five students sit in a row in random order. What is the probability that A and B are adjacent?

A 2/5

B 1/5

C 3/5

D 1/2

E 2/3

30 A fair coin is tossed 5 times. What is the expected number of heads?

A 1

B 2

C 2.5

D 3

E 4

31 A fair six-sided die is rolled once. What is the expected value of the number shown?

A 3

B 3.5

C 4

D 2.5

E 7

32 **A game: toss a fair coin once. If it lands Head you win 2 points; if Tail you lose 1 point. What is the expected score from one play?**

A 0

B 0.5

C 1

D -0.5

E 2

33 **A student flips a fair coin and gets Heads five times in a row. What is the probability the next flip is Tail?**

A 1/6

B 1/3

C 1/2

D 2/3

E 5/6

34 **Two fair dice are rolled. Given that the first roll is even, what is the probability that the sum of the two rolls is 7?**

A 1/12

B 1/6

C 1/9

D 1/3

E 1/18

35 **Two fair dice are rolled. Given that the sum is even, what is the probability that both dice are odd?**

A 1/2

B 1/3

C 2/3

D 1/4

E 3/4

36 **Two fair dice are rolled. Given that at least one die shows a 6, what is the probability that both dice show 6?**

A 1/6

B 1/11

C 1/12

D 2/11

E 1/36

37 **Two fair dice are rolled. Which sum is more likely: 7 or 8?**

A Sum 7

B Sum 8

C Equally likely

D Neither can happen

E Depends on the dice color

38 **Two fair dice are rolled. What is the probability that the product of the two numbers is even?**

A 1/4

B 1/2

C 3/4

D 2/3

E 5/6

39 **Two fair dice are rolled. What is the probability that the maximum of the two numbers is exactly 4?**

A 1/9

B 1/6

C 7/36

D 1/4

E 1/3

40 **Two fair dice are rolled. What is the probability that the minimum of the two numbers is exactly 2?**

A 1/4

B 1/6

C 7/36

D 5/36

E 1/3

41 **A spinner has four equal sectors labeled 1, 2, 3, 4. It is spun once and a fair coin is tossed once. What is the probability of getting an even number AND a head?**

A 1/8

B 1/4

C 1/2

D 3/4

E 3/8

42 **A student guesses answers on 2 multiple-choice questions, each with 5 options and exactly one correct answer. What is the probability they get at least one correct?**

A 1/5

B 9/25

C 16/25

D 2/5

E 1/25

43 A student answers 3 True/False questions by random guessing. What is the probability they get exactly 2 correct?

A 1/8

B 3/8

C 1/2

D 5/8

E 3/4

44 A student answers 3 True/False questions by random guessing. What is the probability they get at least 2 correct?

A 1/4

B 3/8

C 1/2

D 5/8

E 3/4

45 A bag contains 2 red balls and 3 blue balls. Two balls are drawn WITH replacement. What is the probability the two balls are different colors?

A 12/25

B 3/5

C 4/25

D 6/25

E 13/25

46 **A bag contains 2 red balls and 3 blue balls. Two balls are drawn WITHOUT replacement. What is the probability the two balls are different colors?**

A 3/5

B 12/25

C 2/5

D 1/2

E 4/5

47 **In a class of 12 students, 5 are in the chess club, 4 are in the drama club, and 2 are in both clubs. If a student is chosen at random, what is the probability they are in chess OR drama?**

A 7/12

B 3/4

C 5/12

D 1/2

E 1/6

48 **In a class of 12 students, 5 are in chess, 4 are in drama, and 2 are in both. Given that a student is in drama, what is the probability they are also in chess?**

A 1/2

B 2/12

C 2/5

D 7/12

E 1/4

49 **A jar contains 3 red, 2 blue, and 1 green ball. Two balls are drawn WITHOUT replacement. What is the probability of drawing exactly one red ball?**

A 3/5

B 1/2

C 2/5

D 4/5

E 3/10

50 **A jar contains 3 red, 2 blue, and 1 green ball. Two balls are drawn WITHOUT replacement. What is the probability that both balls are non-red?**

A 1/5

B 2/5

C 3/5

D 1/3

E 1/2

51 **A student randomly chooses an integer from 1 to 10 inclusive. What is the probability it is divisible by 2 OR by 5?**

A 3/5

B 1/2

C 2/5

D 3/10

E 4/5

52 **A student randomly chooses an integer from 1 to 6 inclusive. What is the probability it is prime?**

A 1/2

B 1/3

C 2/3

D 1/6

E 5/6

53 **A student randomly chooses 2 different integers from 1 to 10 (without replacement). What is the probability that both chosen numbers are even?**

A 2/9

B 1/5

C 1/4

D 5/9

E 4/9

54 **A student randomly chooses 2 different integers from 1 to 10. Given that at least one chosen number is even, what is the probability that both are even?**

A 2/7

B 2/9

C 1/2

D 5/7

E 1/7

55 **In a very large school, 2/5 of students are left-handed. A computer randomly selects a student, records handedness, and then selects again with replacement (3 selections total). What is the probability that at least one selected student is left-handed?**

A 98/125

B 27/125

C 2/5

D 3/5

E 1/2

56 **A fair die is rolled 3 times. What is the probability of getting at least one 6?**

A 91/216

B 125/216

C 1/6

D 1/2

E 1/3

57 **A fair die is rolled 4 times. What is the probability that no 6 appears?**

A 625/1296

B 671/1296

C 1/6

D 5/36

E 25/36

58 **Two fair coins are tossed. Let A be the event "the first coin is Head" and B be the event "the second coin is Head". Which statement is correct?**

A A and B are independent

B A and B are mutually exclusive

C A implies B

D B implies A

E A and B cannot happen together

59 **Two fair coins are tossed. Let A be "at least one Head" and B be "at least one Tail". Are A and B independent?**

A Yes, independent

B No, not independent

C Yes, because A implies B

D Yes, because B implies A

E They are mutually exclusive

60 **In a school, 60% of students take Biology, 50% take Chemistry, and 30% take both. What is the probability a randomly chosen student takes at least one of these subjects?**

A 1/5

B 1/2

C 4/5

D 3/5

E 9/10

61 **In a school, 60% of students take Biology, 50% take Chemistry, and 30% take both. What is the probability a randomly chosen student takes neither Biology nor Chemistry?**

A 1/5

B 1/2

C 4/5

D 3/5

E 2/5

62 **A screening test is used in a school. 10% of students have a condition. The test detects the condition correctly 90% of the time, and has a 10% false-positive rate. If a student tests positive, what is the probability they actually have the condition?**

A 1/2

B 9/10

C 1/10

D 1/5

E 2/3

63 **A condition affects 20% of students. A test detects it correctly 90% of the time, and has a 20% false-positive rate. If a student tests positive, what is the probability they have the condition?**

A 9/17

B 1/2

C 9/10

D 3/5

E 8/17

64 **In a school, 60% of students take the bus. 10% of bus riders are late. Among students who do NOT take the bus, 5% are late. If a student is late, what is the probability they took the bus?**

A 3/4

B 2/3

C 1/2

D 3/5

E 1/4

65 **A bag contains balls numbered 1, 2, 3, 4, 5. Two balls are drawn WITHOUT replacement. What is the probability that their sum is 6?**

A 1/5

B 2/5

C 1/10

D 1/2

E 3/10

66 **Balls numbered 1-5 are in a bag. Two are drawn without replacement. Given that the sum is 6, what is the probability that one of the numbers is 1?**

A 1/2

B 1/5

C 2/5

D 1/10

E 2/3

67 **A student picks one die at random from a box containing two identical fair dice, then rolls it once. What is the probability of rolling a 6?**

A 1/6

B 1/3

C 1/12

D 2/6

E 5/6

68 **A biased coin lands Heads with probability 2/3. It is tossed twice. What is the probability of getting exactly one head?**

A 4/9

B 1/9

C 2/3

D 5/9

E 2/9

69 **A biased coin lands Heads with probability 2/3. It is tossed twice. What is the probability of getting at least one head?**

A 8/9

B 4/9

C 2/3

D 1/9

E 7/9

70 A fair die is rolled until a 6 appears. What is the probability that the first 6 occurs on the second roll?

A 5/36

B 1/6

C 1/36

D 25/36

E 5/6

71 Names Ana, Ben, Cam, Dee are in a hat. Three different names are drawn WITHOUT replacement. What is the probability that Ana is drawn exactly once?

A 3/4

B 1/4

C 1/2

D 1

E 0

72 A box contains 3 coins: two fair coins and one double-headed coin. A coin is chosen at random and tossed once. It lands Heads. What is the probability the chosen coin was the double-headed coin?

A 1/2

B 1/3

C 2/3

D 3/4

E 1/4

73 In a school, 70% of students pass Math. Among those who pass Math, 60% pass Physics. Among those who fail Math, 20% pass Physics. What is the probability a randomly chosen student passes Physics?

A 12/25

B 3/5

C 2/5

D 24/25

E 7/10

74 A game show has 3 boxes: one contains a prize and two are empty. You pick one box. The host (who knows the prize location) opens one of the other two boxes and shows it is empty. You may switch to the remaining unopened box. If you switch, what is your probability of winning the prize?

A 1/3

B 1/2

C 2/3

D 3/4

E 1

75 In a large school, 1/10 of students are left-handed and 1/5 wear glasses. Assume these traits are independent. What is the probability a randomly chosen student is both left-handed AND wears glasses?

A 1/50

B 1/15

C 1/2

D 1/10

E 1/5

#	Ans	Answer Text
	C	
2	C	2/3
	C	
4	B	1/12
	C	
6	B	1/6
	C	
8	B	1/2
	B	
10	B	1/2
	B	
12	B	1/2
	A	
14	B	1/2
	C	
16	D	4/5
	A	
18	A	0
	B	
20	B	1/2
	A	
22	B	13/15
	A	
24	B	3/8
	A	
26	A	3/5
	B	
28	B	2/5
	A	
30	C	2.5
	B	
32	B	0.5
	C	
34	B	1/6
	A	
36	B	1/11
	A	
38	C	3/4