answers to these 100

1. Basic Probability and Events

1. Probability of even number on dice = 3/6 = 1/2
2. Probability exactly 1 head in two coin flips = 2/4 = 1/2
3. Probability of blue ball = 5/10 = 1/2
4. Probability spinner lands on 3 = 1/4
5. Probability of two tails = 1/4
6. Probability of heart card = 13/52 = 1/4
7. Probability no rain = 1 - 0.3 = 0.7
8. Probability not chocolate = (8+7)/20 = 15/20 = 3/4
9. Complement of spade = 1 - 13/52 = 39/52 = 3/4
10. Probability face card or 10 = (12 face cards + 4 tens)/52 = 16/52 = 4/13

2. Combined and Independent Events

11. Sum is 7: Outcomes = 6/36 = 1/6
12. Both red without replacement: (6/10)*(5/9)=30/90=1/3
13. Two tails = (1/2)*(1/2)=1/4
14. Both dice show same: 6/36 = 1/6
15. Dice 3 and heart card: (1/6)*(1/4)=1/24
16. Both kings without replacement: (4/52)*(3/51)=1/221
17. Independent events: P(A and B) = 0.3*0.5 = 0.15
18. Sum 6 two dice: 5/36
19. P(face 6) = 0 if faces 1-5 given probabilities
20. Both green without replacement: (number green/total)*(number green-1/total-1)

3. Conditional Probability and Bayes' Theorem

21. Total walking = girls walking + boys walking. P(Boy|Walk) = boys walking/total walking
22. Probability two tails = (1 - 0.4)^2 = 0.6^2 = 0.36
23. P(First green | Second green) = P(green then green)/[P(green then green) + P(blue then green)]
24. P(A|B) = P(A and B)/P(B)
25. P(two heads) = 0.16. So P(head) = sqrt(0.16) = 0.4; P(tail)=0.6; P(two tails)=0.6^2=0.36
26. Use binomial formula with p=0.5, calculate P(4 correct) = C(5,4)(0.5)$^{4*(0.5)}$1=5*1/32=5/32
27. Probability one red one blue: P = 2 * (n/12)*(12-n)/11
28. Use counts and conditional probability formulas to calculate given gender and sport choice
29. Use Venn diagram numbers to calculate conditional probabilities
30. P(wins at least one) = 1 - P(loses both) = 1 - (0.4)^2 = 0.84

4. Tree Diagrams and Sequential Events

31. Multiply number of choices: 2*3*2=12
32. Expected winners = total * probability
33. Probability wins at least one = 1 - P(loses both) = 1 - (0.4)^2 = 0.84
34. Use tree diagram branches and multiply probabilities on branches
35. Probability sector = given probability directly
36. Number of girls / total students = 12/30 = 2/5
37. Count letters and divide: #A/total letters
38. Sum to 7 outcomes =6/36=1/6
39. Find all sequence probabilities using product rule
40. Total marbles and color counts determine probabilities of each sequence

5. Experimental, Theoretical and Expected Probability

41. Experimental probability = frequency/total trials = 15/60=0.25
42. Theoretical P(divisible by 3) on 12-sided die = 4/12=1/3
43. Compare experimental outcomes with theoretical probability
44. Expected value = (probability success×win amount) + (probability fail×loss amount)
45. Expected number = total draws × probability of event
46. Multiply expected value per game by number of plays
47. Experimental vs theoretical probability deviation analysis
48. Relative frequency = ratio of times event occurs to total trials
49. Expected profit = (p × win) - (1-p) × cost
50. Calculate distributions for multiple trials using binomial or multinomial formulae

6. Binomial Probability and Distributions

51. P(3 heads in 5 tosses) = C(5,3)$(0.5)^{3(0.5)}$2=10/32=5/16
52. P(x successes) = C(n,x) p^x (1-p)^(n-x)
53. P(X=4) = C(5,4) 0.6^4 0.4^1 = 5 × 0.1296 × 0.4=0.2592
54. Binomial expansion gives coefficients for probability formula
55. Expected heads = n × p = 8 × 0.5=4
56. P(exactly 2 tails)= C(5,2) $(0.3)^{2(0.7)}$3=10×0.09×0.343=0.3087
57. Sum P(X ≤ 3) by adding probabilities P(0), P(1), P(2), P(3)
58. Mean = np, Variance = np(1-p)
59. Increasing n makes binomial distribution approach normal curve
60. Use binomial table or formula to find P(X ≥1)=1-P(0)

7. Venn Diagrams and Set Events

61. P(A ∪ B) = P(A) + P(B) - P(A ∩ B)
62. P(A ∩ B) from given data or formula

63. Use inclusion-exclusion principle
64. Complement P(not A or B) = 1 - P(A ∪ B)
65. Use counts in Venn diagram parts to calculate only one set probability
66. Mutually exclusive means P(A ∩ B)=0, independent means P(A ∩ B)=P(A)×P(B)
67. P(neither A nor B) = 1 - P(A ∪ B)
68. No, mutually exclusive and independent cannot both be true except trivial case
69. Apply Bayes' theorem: P(A|B) = P(B|A)P(A) / P(B)
70. Use three set Venn diagram and known probabilities to calculate unknowns

8. Word Problems and Real-Life Applications

71. Use sequential probability multiplication considering replacement or not
72. Use combined probabilities for multiple conditions
73. Probability first occurrence on nth trial in geometric distribution
74. Multiply probabilities of required wins in sequence
75. Multiply choices for independent meal selection events
76. Multiply success probability by number of trials for expectation
77. Expected value based on payoffs weighted by probabilities
78. Calculate probabilities of winning sequences in independent games
79. Multiply probabilities to find none defective in sequence
80. Use combined and conditional probabilities from partial knowledge

9. Practice with Probability Equations

81. Form equation from sum of probabilities = 1, solve for unknown n
82. Write probability expressions for combined events, solve algebraically
83. Use total outcomes to express probabilities with unknowns
84. Form quadratic from probability equations and solve

85. Create probabilities from tree diagram branches and solve equations
86. Express complement probabilities; solve for unknowns
87. Use known and unknown probabilities to find totals
88. Expected values expressed with unknowns, solve linear equations
89. Use data to calculate probabilities as equations and solve unknowns
90. Balance probability distributions by forming and solving equations

10. Mixed Practice and Exam-style Questions

91. Probability sum 7 or 11 with two dice = P(7)+P(11) = 6/36 + 2/36 = 8/36=2/9
92. Sum 7 with two spinners 1-5 = P(2,5)+P(3,4)+P(4,3)+P(5,2) = 4/25
93. Probability red card or face card = P(red) + P(face) - P(red face) = 26/52 + 12/52 - 6/52 = 32/52=8/13
94. Probability 3 heads in 4 tosses = C(4,3)(0.5)^4 =4 × 0.0625=0.25
95. Probability both same color from known proportions = sum products of color probabilities
96. Compound probabilities: multiply respective event probabilities
97. Use multiplication rule for stages and sums for alternative paths
98. Difference due to independence replacement affects total outcomes
99. Analyze branches of tree diagram to find overall probabilities
100. (0.5+0.5)^2 - 2(0.5)(0.5) = 1 - 0.5 = 0.5