Answers to Probability Questions SET 4

1. 1/2
2. 1/2
3. 5/10 = 1/2
4. 1/4
5. 1/4
6. 13/52 = 1/4
7. 0.7
8. 15/20 = 3/4
9. 3/4
10. 9/13
11. 6/36 = 1/6
12. (6/10) × (5/9) = 1/3
13. 3/8
14. 6/36 = 1/6
15. (1/6) × (1/4) = 1/24
16. (4/52) × (3/51) = 1/221
17. 0.15
18. 5/36
19. 8 green marbles initially
20. 0.3
21. 3/7
22. 6/16 = 3/8
23. 3/6 = 1/2
24. (13+4)/52 = 17/52

25. (12/52) × (11/51) = 1/17
26. (5/12) × (7/11) + (7/12) × (5/11) = 70/132 = 35/66
27. 3/8
28. 0.12
29. (4/10) × (4/10) = 4/25
30. 25/36
31. (12/30) × (11/29) = 132/870 = 22/145
32. (4/10) × (4/10) = 16/100 = 4/25
33. (5/6)^3 = 125/216
34. Expected heads = 5 × 0.5 = 2.5
35. C(8,4) × (0.5)^8 = 70 × (1/256) ≈ 0.273
36. 1 - (0.3)^3 = 1 - 0.027 = 0.973
37. (6+2)/36 = 8/36 = 2/9
38. P(at least 2 passes) = 0.896
39. 0.65
40. (0.1)^2 = 0.01
41. 5
42. C(8,4) × (0.5)^8 ≈ 0.273
43. Expected sixes = 20 × (1/6) ≈ 3.33
44. C(10,3) × (0.4)^3 × (0.6)^7 ≈ 0.2508
45. Sum of P(2 to 6) ≈ 0.617
46. C(5,4) × (0.75)^4 × (0.25)^1 = 0.395
47. (0.4)^4 = 0.0256
48. 10 defective (2% of 500)
49. About 15.87% scored above 85 (Z=1 std dev)
50. About 15.87% taller than 180 cm (Z=1)
51. 1 - (0.02)^3 = 1 - 8e-6 ≈ 0.999992
52. Use binomial CDF, P(X > 5) ≈ 0.02

53. Sum $P(X \geq 4)$ using binomial formula with $p=0.55$
54. $1 - (0.99)^{30} \approx 0.26$
55. $4/48 = 1/12$
56. Use Z-table, approx 15.87% below 60
57. Use normal approximation or Z-score for £350 threshold
58. $C(20,3) \times (0.1)^3 \times (0.9)^{17} \approx 0.057$
59. Use binomial distribution for $P(X \geq 40)$ with $p=0.6$, $n=60$
60. 0.15
61. $(3/5) \times (2/7) = 6/35$
62. Calculate complement population given intersection count
63. $(5/8) \times (4/7) = 20/56 = 5/14$
64. Sampling variation, experiment vs theory
65. Use law of total probability
66. Add probabilities of outcomes with same color
67. Calculate using dice probability table
68. Solve using probability and proportion principles
69. 6 matching dice pairs (1,1), (2,2), … (6,6)
70. Experimental estimates frequencies; theoretical uses model
71. Compute using algebra for unknown n
72. 1/36
73. $3/6 = 1/2$
74. Calculate experimental bias from frequency data
75. Add probabilities for red then blue and blue then red
76. Calculate total submit or total none probabilities
77. Apply inclusion-exclusion principle
78. Calculate with conditional probabilities
79. Intersection of independent events
80. Multiply along tree diagram branches

81. 12/30 = 2/5
82. 15/50 = 3/10
83. $ \frac{n(12-n)}{66} $
84. Multiply branches probabilities
85. Apply multiplication rule for independents
86. Sum and subtract intersect probabilities
87. Use conditional probabilities formula
88. Multiply sequential probabilities
89. Add combined event probabilities
90. Use comparative analysis in dice events
91. Add P(sum=7) and P(sum=11)
92. 4 favorable pairs / 25 total
93. Combine probabilities of red and face cards minus overlap
94. Binomial coefficient × (prob powers)
95. Add probabilities for colors matching
96. Multiply independent weather probabilities
97. Multiply probabilities over event stages
98. Calculate samples with/without replacement
99. Sum products over tree paths
100. Multiply conditional probabilities