Probability - Practice test 1

16 questions | 40 marks | 60 minutes

Compound outcomes, counting and conditional probability.

Equivalent correct methods earn the corresponding marks.

1. List all complete outcomes for two fair coin tosses. [2 marks]

Keep the first and second toss distinct.

Answer: HH, HT, TH, TT.

2. Two fair coins are tossed. Find P(exactly one tail). [2 marks]

HT and TH give 2 favourable outcomes out of 4.

Answer: 1/2.

3. A fair die is rolled. Find P(even or greater than 4). [2 marks]

The union is {2,4,5,6};4/6=2/3.

Answer: 2/3.

4. Two fair dice are rolled. Find P(sum 8). [3 marks]

Favourable ordered pairs:(2,6),(3,5),(4,4),(5,3),(6,2).

There are 36 equally likely pairs.

Answer: 5/36.

5. Choose one of 4 meals,3 drinks and 2 desserts. How many meal combinations? [2 marks]

4×3×2=24.

Answer: 24.

6. How many three-letter codes use distinct letters from A,B,C,D,E? [2 marks]

5×4×3=60.

Answer: 60.

7. Evaluate 5!/3!. [2 marks]

Cancel 3!, leaving 5×4.

Answer: 20.

8. Six students are available for captain and deputy. How many ordered assignments? [2 marks]

6×5=30.

Answer: 30.

9. Use the supplied travel table. [4 marks]

Invented survey of 60 students; every student is in exactly one travel category.

Travel	Girl	Boy	Total
Cycle	12	8	20
Walk	18	22	40
Total	30	30	60

(a) Find P(girl). [2 marks]

30/60=1/2.

Answer: 1/2.

(b) Find P(girl and cycle). [2 marks]

12/60=1/5.

Answer: 1/5.

10. From the travel table, find P(walk|girl). [2 marks]

Invented survey of 60 students; every student is in exactly one travel category.

Travel	Girl	Boy	Total
Cycle	12	8	20
Walk	18	22	40
Total	30	30	60

18 of 30 girls walk;18/30=3/5.

Answer: 3/5.

11. From the travel table, find P(girl|walk). [2 marks]

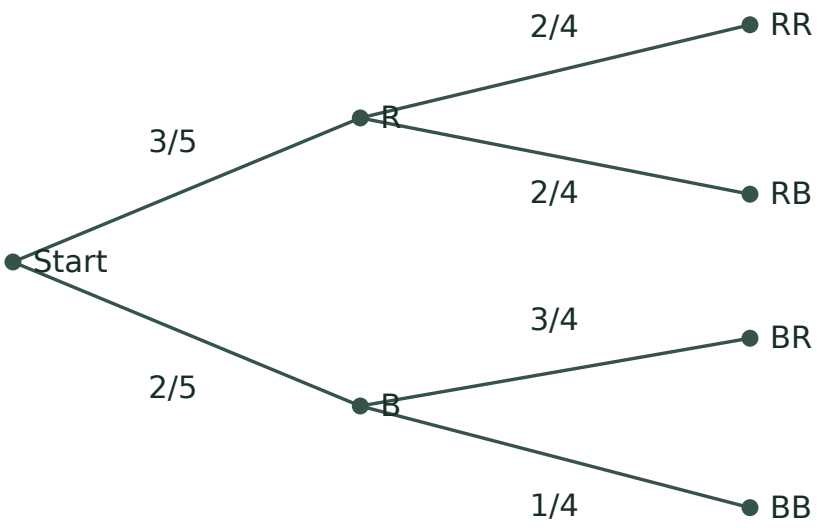
Invented survey of 60 students; every student is in exactly one travel category.

Travel	Girl	Boy	Total
Cycle	12	8	20
Walk	18	22	40
Total	30	30	60

18 of 40 walkers are girls;18/40=9/20.

Answer: 9/20.

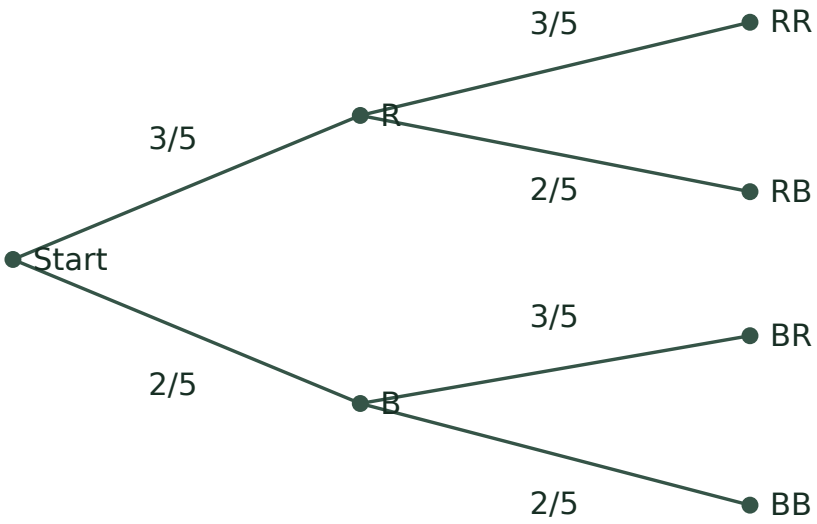
12. A bag has 3 red and 2 blue counters. Two are drawn without replacement. Find P(two red). [2 marks]



(3/5)(2/4)=3/10.

Answer: 3/10.

13. A bag contains 3 red and 2 blue counters. Draw twice at random with replacement. Find P(exactly one red). [3 marks]



RB=(3/5)(2/5)=6/25.

BR=6/25;add to 12/25.

Answer: 12/25.

14. P(A)=0.4, P(B)=0.6 and P(A and B)=0.2. Are A and B independent? Justify. [3 marks]

P(A)P(B)=0.24, not 0.2.

Answer: No.

15. A simulation of a theoretical 0.6 success probability gives 284 successes in 500 trials. [4 marks]

(a) Estimate the success probability. [2 marks]

284/500=0.568.

Answer: 0.568.

(b) Does the difference from 0.6 prove the simulation rule is wrong? [2 marks]

Finite random runs can differ from the theoretical probability.

Answer: No.

16. In the club table, find P(music or drama), showing how overlap is handled. [3 marks]

Invented membership data for 60 students.

Music membership	Drama	Not drama	Total
Music	8	12	20
Not music	10	30	40
Total	18	42	60

There are 20+18−8=30 in at least one club.

30/60=1/2.

Answer: 1/2.