Year 8 Probability - Topic test

15 questions | 36 marks | 45 minutes

Progressive questions combine techniques, interpretation and reasoned applications. All practice data are supplied.

Equivalent correct methods earn the corresponding marks.

1. If P(A)=0.37, find P(not A). [1 mark]

1−0.37=0.63.

Answer: 0.63.

2. A bag has 5 red,2 blue,3 yellow counters. Find P(not blue). [2 marks]

Eight of ten counters are not blue.

Answer: 4/5.

3. List outcomes for two ordered coin tosses. [2 marks]

Pair each first outcome with both second outcomes.

Answer: HH,HT,TH,TT.

4. A fair coin then an independent fair 1,2,3 spinner is used. Find P(head and spinner 2). [2 marks]

H2 is one of six equally likely outcomes.

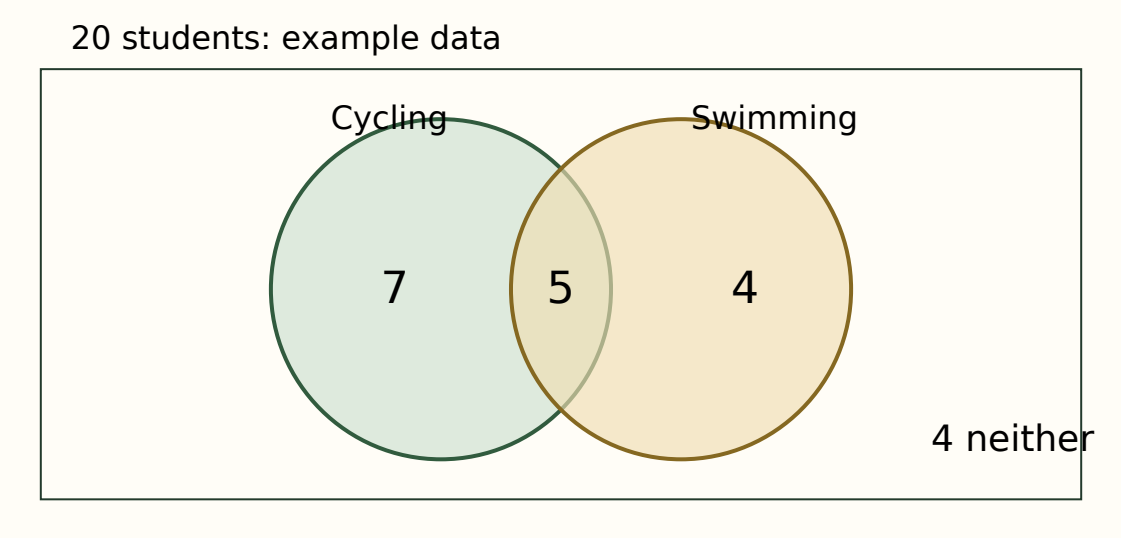
Answer: 1/6.

5. Two independent fair spinners each show 1,2,3. List sum-4 pairs and their probability. [3 marks]

Three favourable pairs out of nine.

Answer: (1,3),(2,2),(3,1); probability 1/3.

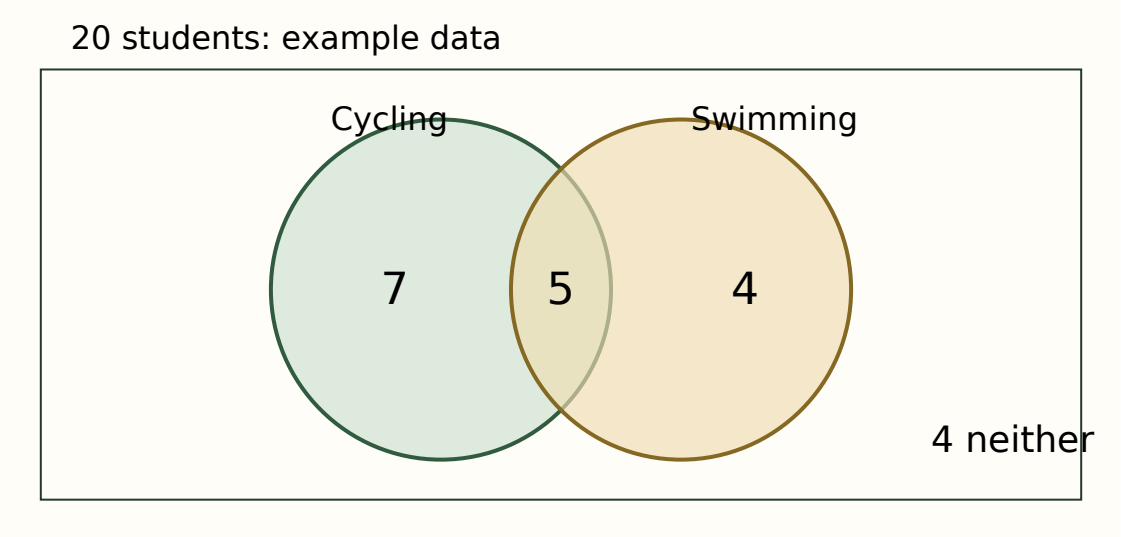
6. Use the Venn diagram. Find P(swimming but not cycling). [2 marks]



The swimming-only region has 4 of 20.

Answer: 1/5.

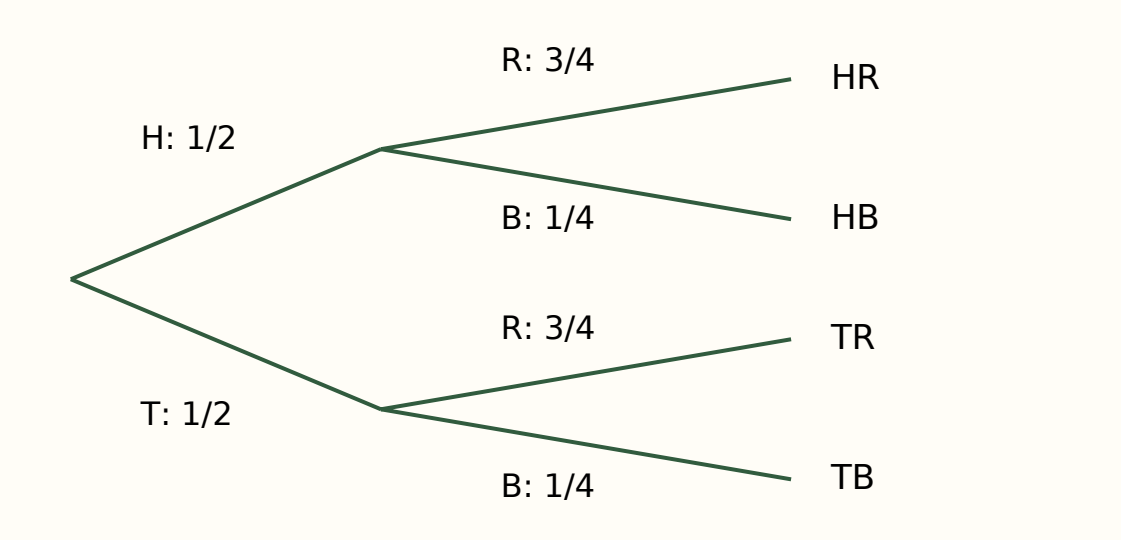
7. Use the Venn diagram. Find P(cycling or swimming). [2 marks]



7+5+4=16 of 20, counting overlap once.

Answer: 4/5.

8. Use the tree. Find P(head and red). [2 marks]



1/2×3/4=3/8.

Answer: 3/8.

9. A bag has 2 red and 3 blue tokens. Draw a token at random, replace it, then draw again at random. Find P(two red). [2 marks]

2/5×2/5=4/25.

Answer: 4/25.

10. Draw two tokens at random without replacement from B1, B2 and G. Find P(one of each colour). [3 marks]

Four of six ordered physical pairs contain G and one blue.

Answer: 2/3.

11. Find P(odd or greater than 4) for a fair die. [2 marks]

The union {1,3,5,6} has four outcomes.

Answer: 2/3.

12. A probability-1/4 event occurs 41 times in 160 trials. State expected frequency and experimental probability. [3 marks]

160×1/4=40; the observed ratio is 41/160.

Answer: Expected 40; experimental 41/160.

13. An event occurs 16 times in 40 trials and 44 times in 160 more. Find the combined frequency estimate. [3 marks]

(16+44)/(40+160)=60/200=0.3.

Answer: 0.3.

14. Use the simulation table to estimate P(exactly one head) and compare with theory. [3 marks]

Original practice simulation: 24 trials of two fair coins

Outcome	Count
HH	5
HT	7
TH	6
TT	6

HT and TH total 13, compared with 12 expected successes in 24 trials.

Answer: 13/24 versus 1/2.

15. Design a two-dice simulation and explain why drawing sums uniformly from 2 to 12 fails. [4 marks]

There is one pair for sum 2 but six for sum 7.

Answer: Draw two independent 1-6 results per trial. Uniform sums wrongly give 2 and 7 equal chance.