Conditional language and restricted sample spaces

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. A fair six-sided die result is known to exceed 3. Find P(even). [2 marks]

Restrict to 4,5,6;4 and 6 are even.

Answer: 2/3.

2. A fair six-sided die result is known to be even. Find P(greater than 3). [2 marks]

Restrict to 2,4,6;4 and 6 exceed 3.

Answer: 2/3.

3. Find P(cycle|girl) from the table. [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

12/30=2/5.

Answer: 2/5.

4. Find P(girl|cycle) from the table. [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

12/20=3/5.

Answer: 3/5.

5. Using the travel table, explain why P(cycle|girl) and P(girl|cycle) have different denominators. [3 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

Girls total 30, cyclists total 20.

The same overlap 12 is divided by different totals.

Answer: They condition on different groups.

6. P(A and B)=0.12 and P(B)=0.3. Find P(A|B). [2 marks]

0.12/0.3=0.4.

Answer: 0.4.