Conditional probabilities from tables/trees

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Using the club table, find P(drama|music). [2 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

8/20=2/5.

Answer: 2/5.

2. Find P(not drama|not music). [2 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

30/40=3/4.

Answer: 3/4.

3. Find P(music and drama). [2 marks]

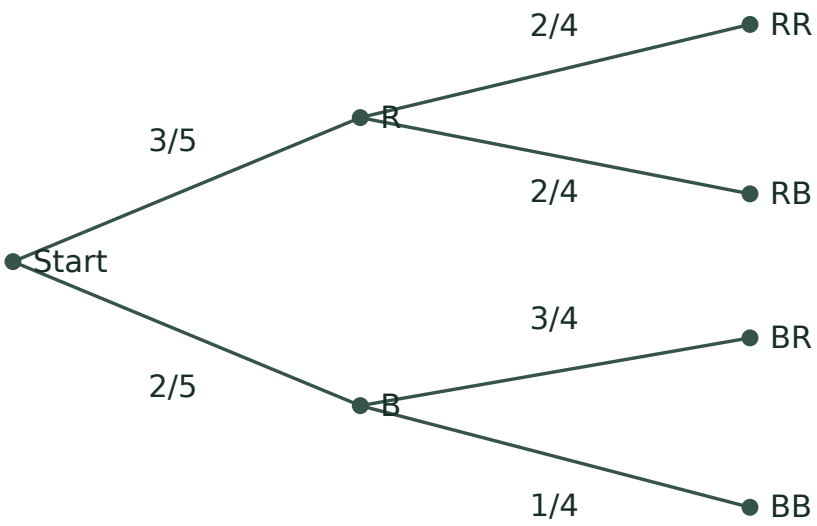
Invented membership data for 60 students.

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

8 of all 60 do both;8/60=2/15.

Answer: 2/15.

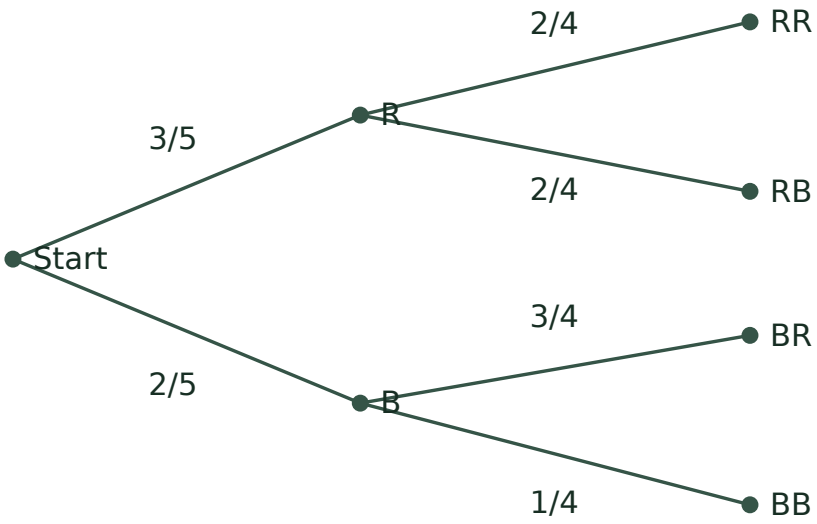
4. Use the tree to find P(two red). [2 marks]



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

Answer: 3/10.

5. Use the tree to find P(at least one red). [3 marks]

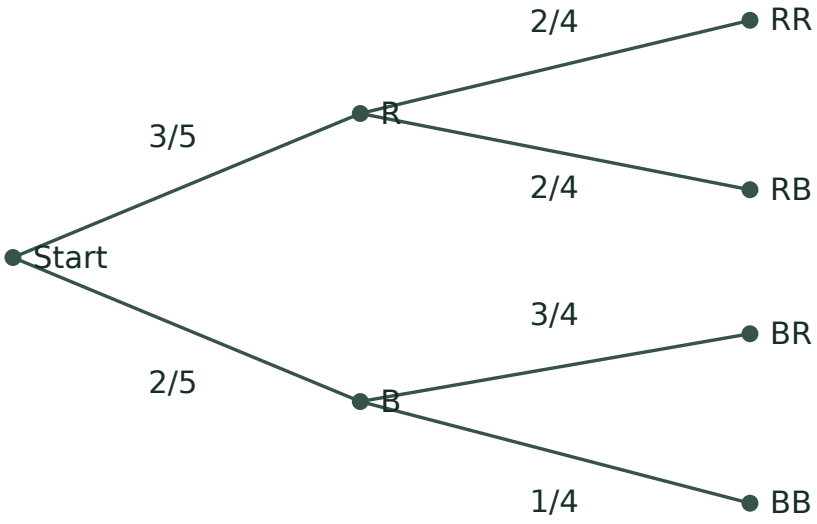


The only excluded outcome is BB with probability 1/10.

1−1/10=9/10.

Answer: 9/10.

6. Explain how to check that a completed four-leaf tree is consistent. [3 marks]



For this tree the leaf probabilities are 3/10,3/10,3/10,1/10.

Their sum is 1.

Answer: Every split totals 1, and all leaf probabilities total 1.