

(i) Alice, Bob, and Charlie make the following statements:

Alice: Bob is lying.

Bob: Charlie is lying.

Charlie: $1 + 1 = 2$.

Who is telling the truth? Who is lying?. Explain your answer.

(ii) Now Alice, Bob, and Charlie make the following statements:

Alice: Bob is telling the truth.

Bob: Alice is telling the truth.

Charlie: Alice is lying.

What are the possible numbers of people telling the truth? Explain your answer.

(iii) They now make the following statements:

Alice: Bob and Charlie are both lying.

Bob: Alice is telling the truth or Charlie is lying (or both).

Charlie: Alice and Bob are both telling the truth.

Who is telling the truth and who is lying on this occasion? Explain your answer.