CSE 103

Chapter 1,Section 2

Problem No. 32

The police have three suspects for the murder of Mr. Cooper: Mr. Smith, Mr. Jones, and Mr.Williams. Smith, Jones, and Williams each declare that they did not kill Cooper. Smith also states that Cooper was a friend of Jones and that Williams disliked him. Jones also states that he did not know Cooper and that he was out of town the day Cooper was killed. Williams also states that he saw both Smith and Jones with Cooper the day of the killing and that either Smith or Jones must have killed him. Can you determine who the murderer was if

a) one of the three men is guilty, the two innocent men are telling the truth, but the statements of the guilty man may or may not be true?

b) innocent men do not lie?

Solution:

Let S be Smith tells true , so S = Cooper was a friend of Jones and Williams disliked Cooper.

∴ ㄱS = Cooper was not a friend of Jones or Williams liked Cooper.

Let J be Jones tells true , so J = Jones didn’t know Cooper and Jones was out of town that day .

∴ ㄱJ = Jones knew Cooper or Jones was in town that day .

Let W be Williams tells true , so W = Smith and Jones was with Cooper that day and either Smith or Jones must have killed Cooper.

∴ ㄱW = Smith and Jones wasn’t with Cooper that day or (neither Smith nor Jones must not have killed Cooper.)

1. Now Let statement of guilty man is true , so SΛJΛW must be true . But SΛJΛW is false, because JΛW is false.

Again Let statement of guilty man is true :

If Smith is guilty then ㄱSΛJΛW must be true. But JΛW is false.

Else if Jones is guilty then SΛㄱJΛW must be true. Here SΛㄱJΛW is true.

Else if Williams is guilty then SΛJΛㄱW must be true. But SΛJ is false.

1. From answer A we saw that if innocent men do not lie then Jones is Culprit.