**QUESTION:**

Consider the following knowledge base that describes when a car should brake:

PersonInFrontOfCar -> Brake 1

((YellowLight ^ Policeman) ^ ~Slippery) -> Brake 2

Policecar -> Policeman 3

Snow -> Slippery 4

Slippery -> ~Dry 5

RedLight -> Brake 6

Winter -> Snow 7

Given the following observations:

YellowLight ^ ~RedLight ^ Dry ^ Policecar ^ ~PersonInFontOfCar 8

Using the various propositional logic rules, show how the following can be inferred. State the inference rule and statement used.

**SOLUTION:**

1. Policecar: From sentence 8, AND elimination 9
2. Policeman: From sentence 3, Modus Ponens 10
3. Dry: From sentence 8, AND elimination 11
4. ~Slippery: From sentence 11 and 5, Modus Tollens 12
5. YellowLight: From sentence 8, AND elimination 13
6. YellowLight ^ Policeman ^ ~Slippery: From sentence 10,12 and 13 AND introduction 14
7. Brake: From sentence 14 and 2: Modus Ponens 15
8. ~Snow: From sentence 4 and 12, Modus Tollens 16
9. ~Winter: From sentence 7 and 16, Modus Tollens 17