

### 3.24.1. Semantic Problems: Validity

**Translate** each of the following arguments into formal language, and then use **truth trees** to decide whether the argument is **valid**.

1. The senate will pass the bill without holding a special hearing.  
The governor will sign the bill unless the senate holds a special hearing.  
 $\therefore$  The senate will pass the bill, and the governor will sign it.
2. *Shao Lin Logic* was filmed in either Hong Kong or Beijing.  
*Shao Lin Logic* featured fight scenes, but didn't use stunt men.  
 $\therefore$  Unless *Shao Lin Logic* used stunt men, it was filmed in Hong Kong.
3. Nick will have either a martini or an Old Fashioned, and so will Nora.  $\therefore$   
Either Nick and Nora will both have a martini, or they'll both have an Old Fashioned.
4. Either Timbuktu Tech will win the game without going into overtime, or Bleak Prairies University will win the game without advancing to the finals.  
Timbuktu Tech will neither go into overtime nor win the game.  
 $\therefore$  Bleak Prairies University will not advance to the finals.
5. Kangaroos are indigenous to either Europe or Australia. Kangaroos are indigenous to either Australia or South America. Kangaroos are not indigenous to Europe.  $\therefore$  Kangaroos are indigenous to South America.
6. Either both Neko and Jack are going to Logicpalooza, or Suki isn't.  
Neko isn't going to Logicpalooza, but either Jack or Suki is.  $\therefore$  Jack is going to Logicpalooza.
7. Unless Descartes is thinking, he cannot doubt that he is thinking  
Either Descartes can doubt that he is thinking, or he is thinking. Descartes isn't thinking unless he exists.  $\therefore$  Descartes exists.  
(from Kalish, Montague, and Mar 1980: p. 35, #34)
8. Neither Trixie nor Elvis will serve on the committee unless Dr. Slim wins the vote. Elvis will serve on the committee without Trixie doing so. The new rules will pass without Dr. Slim winning the vote, unless either Deacon or Tangelo challenges them.  $\therefore$  Tangelo will challenge the new rules.

**B.** The following argument is clearly **invalid** (since the actual world serves as a validity counterexample).

### INVALID

1. Kangaroos are indigenous to either Europe,  
or South America, or Australia

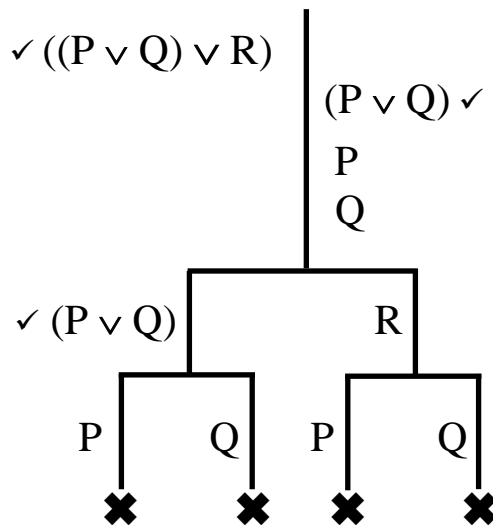
1.  $(P \vee Q) \vee R$ .

$\therefore$  Kangaroos are indigenous to either Europe  
or South America.

$\therefore (P \vee Q)$

But in the following tree for the argument every path closes – thereby (wrongly) judging the argument to be **valid**.

### 💀 A Flawed Tree 💀



**Explain what mistake has been made** in this truth tree.