Boone Tison

2.1-2.3 Homework

2.2 - #18:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| W | T | d | (W ^ T) 🡪 d | (~W v ~T) v d | (~W ^ ~T) 🡪 ~d |
| T | T | T | T | T | T |
| T | T | F | F | F | T |
| T | F | T | T | T | T |
| T | F | F | T | T | T |
| F | T | T | T | T | T |
| F | T | F | T | T | T |
| F | F | T | T | T | F |
| F | F | F | T | T | T |

The first and second statements are logically equivalent, as they have matching truth tables, however, the third statement is not equivalent with them as it has a different truth table.

2.3 - #6:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | q | p 🡪 q | q 🡪 p | p v q |
| T | T | T | T | T |
| T | F | F | T |  |
| F | T | T | F |  |
| F | F | T | T | F |

The premises are the first two columns, p 🡪 q and q 🡪 p. The conclusion is the last column, p v q. This argument is invalid, as not all rows of the truth table are true. The last column only includes rows where both premises are true, but row 4 is not true. While the premises are true, the conclusion is false for row 4, making the argument invalid.

2.3 - #30:

C 🡪 O

O

Therefore C

This argument is invalid because of the converse error. This argument assumes the conclusion is true when the second premise is satisfied, however it fails to recognize that the second premise does not require the implication to be true.

2.3 - #40:

Socko 🡪 Lefty

Fats 🡪 ~Muscles

Lefty 🡪 ~Muscles ^ ~Socko

Muscles 🡪 ~Lefty

Socko and Muscles have contradictory statements, meaning one of them is telling the truth. Thus, we know that both Fats and Lefty are lying. Fats tells us that Muscles is the one telling the truth and the one who killed Sharky. Lefty also tells us that Muscles and Socko were not shooting craps when Sharky was killed.