Discrete Structures

9/21/23 — HW #3 — Josiah Schmitz

2.2.4. If you don't fix my ceiling, I won't pay my rent.

2.2.13b.

p	q	~q	~(p→q)	p∧~q
T	T	F	F	F
T	F	T	T	T
F	T	F	F	F
F	F	T	F	F

Because ~(p→q) and p∧~q have the same truth values, they are logically equivalent.

2.2.27.

p	q	q→p	~p→~q
T	T	T	T
T	F	T	T
F	T	F	F
F	F	T	T

The statement is true.

2.3.4. It cannot be colored with three colors.

2.3.9.

p	q	r	~q	~r	p∧q	p∨~q	~q→p	p∧q→~r
T	T	T	F	F	T	T	T	F
T	T	F	F	T	T	T	T	T
→ T	F	T	T	(F)	F	T	T	T
T	F	F	T	T	F	T	T	T
F	T	T	F	F	F	F	T	T
F	T	F	F	T	F	F	T	T
F	F	T	T	F	F	T	F	T
F	F	F	T	T	F	T	F	T

This row has all true premises but a false conclusion, so the argument is invalid.