

Worksheet 3

1. Simplify the following expressions.

(a) $(p \vee q) \wedge (\neg p \vee \neg q) \wedge \neg(p \leftrightarrow q)$

(b) $((p \rightarrow \neg q) \wedge p) \rightarrow (p \rightarrow q)$

(c) $(p \vee \neg q) \wedge (q \vee \neg r) \wedge (r \vee \neg p)$

2. Are the following arguments valid?

(a) If I eat that burger, I will get sick. If I don't eat the burger, the cook will be disappointed. Therefore, the cook will be disappointed if I don't get sick.

(b) Either I slept in or I showed up to work. If I showed up to work, my boss ignored me. My boss did not ignore me. Therefore, I must have slept in.