

$$1. A \rightarrow \neg B \vee \neg C$$

$$\neg B \rightarrow A \vee C$$

$$C \rightarrow B.$$

$$B \equiv T, C \equiv T: F \rightarrow A \vee T \quad T \quad \checkmark$$

$$A \rightarrow F \vee F \quad T \Rightarrow A \equiv F.$$

$$B \equiv F, C \equiv T: T \rightarrow F \quad \times.$$

2. Assume that $\log_2(q)$ is rational.

then there would be two integers $a \neq 0, b \neq 0$ has no common

factor that $\log_2(q) = \frac{a}{b}.$

$$q = 2^{\frac{a}{b}} \quad q^b = 2^a.$$

q^b will always be odd number and 2^a will always be even number. so the equation never be true

$$3. (p \vee (q \wedge (q \vee s))) \wedge (\neg p \vee (\neg q \wedge (\neg q \vee r))) \wedge (p \vee s) \wedge (\neg p \vee r)$$

$$q \wedge (q \vee s) \equiv (q \wedge q) \vee (q \wedge s) \equiv q \quad \text{absorption law.}$$