23. Which of the following is logically equivalent to $\sim(\sim p \to q)$?

(1) $p \wedge q$

(2) $p \wedge \sim q$

(3) $\sim p \wedge q$

(4) $\sim p \wedge \sim q$

23. (4) We know that $p \rightarrow q \equiv \sim p \vee q$

$$\therefore \quad \sim p \rightarrow q \equiv p \vee q$$

$$\therefore \quad \sim(p \rightarrow q) \equiv \sim(p \vee q)$$

$$\equiv \sim p \wedge \sim q$$