

AI Quiz 4

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- Q2-3 (1) Cricketers are either a batsman or bowler.
(2) Any virus that is coronavirus and is a double mutant is a deadly virus.
(3) Any virus that is coronavirus and is its double mutant is not a deadly virus.

or

Any virus that is double mutant coronavirus is not deadly.

$$Q1 \rightarrow \sim ((\exists x)(P(x)) \vee (\exists x)Q(x)) \vee (\exists x)[P(x) \vee Q(x)]$$

$$= \forall x \sim P(x) \wedge \forall x \sim Q(x) \vee \exists x(P(x) \vee Q(x))$$

Using skolem to remove existential quantifier

$$= \forall x (\sim P(x) \wedge \sim Q(x)) \vee (P(s(x)) \vee Q(s(x)))$$

$$= [(\sim P(x)) \vee \sim Q(s(x))] \vee Q(s(x)) \wedge$$

$$[P(s(x)) \vee Q(s(x))]$$

Q3 → (1)

$$(1) \forall x \forall y \text{ stretchable}(x) \wedge \text{blue}(x) \rightarrow \neg \text{stretchable}(y) \wedge \text{black}(y)$$

$$(2) \forall x \text{ blue}(x) \vee \text{black}(x)$$

$$(3) \exists x \forall x_2 \neg \text{stretchable}(x) \rightarrow \text{stretchable}(x_2) \wedge \text{black}(x_2)$$

$$(4) \text{stretchable}(1)$$

$$(5) \neg \text{stretchable}(2)$$

$$(2) \neg (\text{stretchable}(x_1) \wedge \text{blue}(x_1)) \vee$$

$$\neg \text{stretchable}(x_1) \wedge \text{black}(x_2)$$

$$(\neg \text{stretchable}(x_1) \vee \neg \text{blue}(x_1))$$

$$\vee (\neg \text{stretchable}(x_2) \wedge \text{black}(x_2))$$