GMI23G Logic and Mathematics for Computer Science P3/2022

Homework Math Problem Set 1 Solution resubmission

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1.4)

(a)

D(x): x is a Driver

H(x): x is Happy

F(x): x drives a Ford Evos.

a) All drivers will be happy only if they drive a ford Evos.

For all x, if x is a driver & x is happy, then x drives a Ford Evos.

$$(\forall x)\left[(D(x) \wedge H(x)) \longrightarrow F(x)\right]$$

b) Every fridge contains Milk

F(x): x is a fridge

M(x): x contains Milk

For all x, if x is a fridge, then x contains Milk

$$(\forall x)\left[F(x) \longrightarrow M(x)\right]$$

c) None of the players scored a goal but all of them had a shot.

$P(x)$: x is a player

$S(x)$: x had a shot

$G(x)$: x scored a goal

For all x, if x is a player, then x had a shot & negation of x scored a goal

$$(\forall x)\left[P(x) \rightarrow \left(S(x) \wedge (G(x))'\right)\right]$$

d) If bike has no wheels then no body can ride it.

$B(x)$: x is a Bike

$W(x)$: x has wheels

$R(x)$: x can be ridden

~~For~~ all x, if x is a bike & and negation of x has wheels, then negation of x can be ridden

$$(\forall x)\left[\left(B(x) \wedge (W(x))'\right) \rightarrow (R(x))'\right]$$