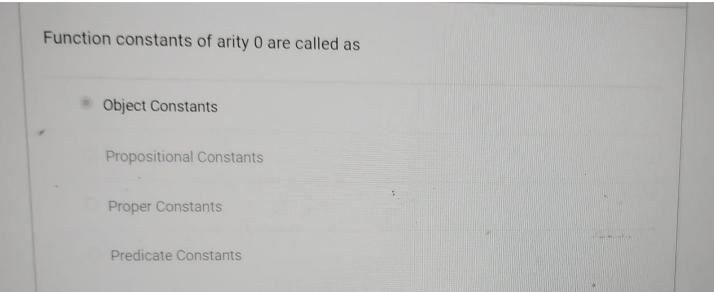
Choose the correct propositional logic for the English sentence: "Children and teenagers are not adults"

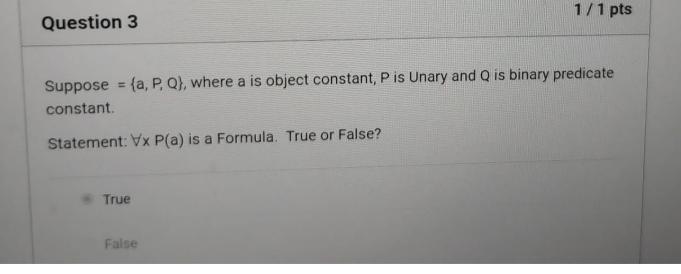
 $(Children \lor Teenagers) \lor \neg Adults$

 $(Children \wedge Teenagers) \rightarrow \neg Adults$

 \bigcirc (Children \lor Teenagers) $\rightarrow \neg Adults$

 $(Children \wedge Teenagers) \vee \neg Adults$





Do

What are the free variables in the below Formula F1?

F1:
$$(\forall x (P(x) \land Q(x))) \longrightarrow (\neg P(x) \lor Q(y))$$

2

5

2,3

None

4,5

2,3,4

Since 2, 3 are bound by 1, 4 and 5 are the free variables

Statement: Following first-order formula is satisfiable. True or False?

 $\{\exists x P(x), \exists x Q(x)\} \models \exists x (P(x) \land Q(x))\}$

True .

False

For suppose if we take P as even and Q as odd there exists no such element x which is both even and odd so it is false

Question 6

0.5 / 1 pts

Every student who takes CSE579 is intelligent.

- $\exists x \neg Student(x) \lor \neg Takes(x, CSE579) \lor Intelligent(x)$
- $\exists x Student\left(x\right) \land Takes\left(x, CSE579\right) \rightarrow Intelligent\left(x\right)$
- $\forall x \neg Student(x) \lor \neg Takes(x, CSE579) \lor Intelligent(x)$
- $riangleq \forall x Student\left(x
 ight) \land Takes\left(x, CSE579
 ight)
 ightarrow Intelligent\left(x
 ight)$

Consider the following statements in first-order logic:

1)
$$\forall x \left(P\left(x \right) \wedge Q(x) \right)$$

2)
$$\exists x \left(P\left(x \right) \wedge Q\left(x \right) \right)$$

, 3)
$$\forall x P(x) \wedge \forall x Q(x)$$

4)
$$\exists x P(x) \wedge \exists x Q(x)$$

Which of these statements expresses the idea that "Every individual satisfies both properties P and Q"?

3

2

1

Which of the following statements are true for any first-order formula F and G, and for any interpretation I?

1)
$$(F \lor G)^I = \lor \left(F^I, G^I\right)$$

2) $(\lnot G)^I = \lnot (G^I)$

$$2)\left(\neg G\right)^{I} = \neg(G^{I})$$

3)
$$\exists x F(x)^I = t \; ext{if} \; F(c^*)^I = t \; ext{for some} \; c \in |I|$$

2,3

1,2,3

1,3

Question 9

1/1 pts

A set of clauses S is Herbrand satisfiable iff, the set of all ground instances of clauses in S is Herbrand satisfiable.

True or False?

- True
 - False

De

Every student of CSE579 who reads everyday gets an A in CSE579.

 $\forall x Student\left(x\right) \land Takes\left(x, CSE579\right) \land \forall y Day\left(y\right) \land ReadsOnDay\left(x, y\right) \rightarrow GetA\left(x, CSE579\right)$

 $\forall xStudent\left(x\right) \land Takes\left(x, CSE579\right) \land \forall y\left(Day\left(y\right) \rightarrow ReadsOnDay\left(x,y\right)\right) \rightarrow GetA(x, CSE579)$

 $\forall x Student(x) \land Takes(x, CSE579) \land \exists y (Day(y) \land ReadsOnDay(x, y)) \rightarrow Get A(x, CSE579)$

 $\forall x \forall y Student\left(x\right) \land Day\left(y\right) \land ReadsOnDay(x,y) \land Takes\left(x,CSE579\right) \rightarrow GetA(x,CSE579)$