



ma



2023W... / Module SMT: Quantifier-Free First-O... / S...



## SMT3Q

Started on	Monday, 22 January 2024, 7:16 PM
State	Finished
Completed on	Monday, 22 January 2024, 7:29 PM
Time taken	12 mins 55 secs
Grade	4.33 out of 5.00 (86.67%)

## Question 1

Correct

Mark 1.00 out of 1.00

Flag question

Given the following formula over integers

$$((x < y) \vee (x+1 = y)) \wedge (\neg(x+1 = y) \vee (x \geq 0)) \wedge (y = 2) \wedge (x \geq 0)$$

with its propositional skeleton

$$(a \vee b) \wedge (\neg b \vee d) \wedge c \wedge d$$

How many theory consistent propositional solutions does the propositional skeleton of this formula have?

Thus we are seeking the number of different assignments to the propositional skeleton which not only satisfy it propositionally but also are theory consistent. Note that the formula can also be theory inconsistent.

Answer:



The correct answer is: 2

## Question 2

Partially correct

Mark 1.33 out of 2.00

Flag question

Given the following SMT formula:

$$((x = y) \vee (f(x) = y)) \rightarrow \neg(x = y)$$

Which of the following formulas are a propositional skeleton (abstraction) of this formula? Logical simplifications are allowed.

Select one or more:

☒  $\neg a \wedge (\neg a \vee \neg b)$  ✓☐  $\neg a \wedge (\neg a \vee b)$ ☐  $(a \vee b) \rightarrow b$ ☐  $(a \vee b) \rightarrow \neg c$ ☐  $(a \vee b) \rightarrow a$ ☒  $(a \vee b) \rightarrow \neg a$  ✓

Die Antwort ist teilweise richtig.

You have correctly selected 2.

The correct answers are:

$$(a \vee b) \rightarrow \neg a,$$

$$\neg a \wedge (\neg a \vee \neg b),$$

$$(a \vee b) \rightarrow \neg c$$

## Question 3

Correct

Mark 2.00 out of 2.00

Flag question

Given the following set S of propositional formulas

$$\{\neg a, \neg b, (a \vee b \vee c), (a \vee \neg b), (a \vee \neg d), (d \vee \neg c), b\}$$

Select among the following sets of formulas all which are a minimal unsatisfiable subset (MUS) of the given set S.

Select one or more:

☐  $\{\neg a, \neg b, (a \vee b \vee c)\}$ ☐  $\{a, \neg a\}$ ☒  $\{\neg a, \neg b, (a \vee b \vee c), (a \vee \neg d), (d \vee \neg c)\}$  ✓☐  $\{\neg a, \neg b, (a \vee b \vee c), (a \vee \neg d), (e \vee \neg c)\}$ ☒  $\{\neg a, b, (a \vee \neg b)\}$  ✓☒  $\{\neg b, b\}$  ✓☐  $\{\neg a, \neg b, (a \vee b \vee c), (a \vee \neg d), (d \vee \neg c), b\}$ 

Your answer is correct.

The correct answers are:  $\{\neg b, b\}$ ,  $\{\neg a, \neg b, (a \vee b \vee c), (a \vee \neg d), (d \vee \neg c)\}$ ,  $\{\neg a, b, (a \vee \neg b)\}$

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