338.001, VL Logic, Martina Seidl / Wolfgang Schreiner / Wolfgang Windsteiger, 2022W

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Started on	Monday, 23 January 2023, 7:16 PM
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Time taken	7 mins 25 secs
Grade	**5.00** out of 5.00 (**100**%)

Question 1

Correct

Mark 1.00 out of 1.00

Flag question

The validity of the formula $P \rightarrow S$ can also be proven by showing that

Select one or more:

- a. $P \wedge \neg S$ is unsatisfiable ✔
- b. $\neg(P \rightarrow S)$ is unsatisfiable ✔
- c. $(P \vee S)$ is unsatisfiable
- d. $(P \vee S)$ is satisfiable
- e. $P \wedge \neg S$ is satisfiable

Your answer is correct.

The correct answers are: $P \wedge \neg S$ is unsatisfiable, $\neg(P \rightarrow S)$ is unsatisfiable

Question 2

Correct

Mark 2.00 out of 2.00

Flag question

Given the following conjunction of inequalities in the reals

$x + y - z \leq 2 \quad \wedge \quad x - y + z \leq 3 \quad \wedge \quad -x + y + z \leq 4$

During the application of the Fourier-Motzkin Procedure we isolate and eliminate the variable 'x' next.

Which formulas do we obtain after eliminating 'x' (also consider intermediate results)

Select one or more:

- $y + z - 4 \leq 2 + y - z \quad \wedge \quad y + z - 4 \leq 1 - y + z$
- $2z \leq -2 \quad \wedge \quad 2y \leq -3$
- $2y \leq 6 \quad \wedge \quad 2z \leq 7$ ✔
- $z - 4 \leq 2 - z \quad \wedge \quad y - 4 \leq 1 - y$
- $y + z - 4 \leq 2 - y + z \quad \wedge \quad y + z - 4 \leq 3 + y - z$ ✔
- $y - 4 \leq 2 \quad \wedge \quad z - 4 \leq 3 - z$

Your answer is correct.

The correct answers are: $y + z - 4 \leq 2 - y + z \quad \wedge \quad y + z - 4 \leq 3 + y - z$, $2y \leq 6 \quad \wedge \quad 2z \leq 7$

Question 3

Correct

Mark 2.00 out of 2.00

Flag question

Apply the congruence closure algorithm to the following formula.

$a = b \wedge x = y \wedge u = f(a, x) \wedge v = f(a, y) \wedge x = g(u, b) \wedge z = g(v, a)$

Which partitions (equivalence relations) of the variables can occur during the execution of the congruence closure algorithm?

Select one or more:

- [a b | u | v | x y | z] ✔
- [a | b | u | v | x y | z] ✔
- [a b | u v | x y z] ✔
- [a b | u | v | x y z]
- [a | b | u v | x | y | z]
- [a | b | u v | x y z]

Your answer is correct.

The correct answers are: [a b | u | v | x y | z], [a | b | u | v | x y | z], [a b | u v | x y z]

Finish review