

CSCA67H3 - Discrete Mathematics

Week 1 Tutorial Questions

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Chapter 1

Solutions

Either John or Bill are telling the truth. Either Sam or Bill are lying. Therefore, either John is telling the truth or Sam is lying.

Cookie cutter disjunctive syllogism.

$$(J \vee B)$$

$$(\neg S \text{ or } \neg B)$$

$$\therefore J \vee \neg S$$

J	B	S	$J \vee B$	$S \rightarrow B$	$(S \rightarrow B) \vee J$	$(J \vee B) \vee (S \rightarrow B)$	$J \vee S$
T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	T
T	F	T	T	F	T	T	T
T	F	F	T	T	T	T	T
F	T	T	T	T	T	T	T
F	T	F	T	T	T	T	F
F	F	T	F	F	F	F	T
F	F	F	F	T	T	T	F

Jane and Pete won't both win the math prize. Pete will win either the math prize or the chemistry prize. Jane will win the math prize. Therefore, Pete will win the chemistry prize.

$$\neg(J_m \wedge P_m)$$

$$P_m \vee P_c$$

$$J_m$$

$$\therefore P_c$$

J_m	P_m	J_c	P_c	$\neg(J_m \wedge P_m)$	$(P_m \vee P_c)$	J_m	P_c
T	T	T	T	F	T	T	T
T	T	T	F	F	T	T	F
T	T	F	T	F	T	T	T
T	T	F	F	F	T	T	F
T	F	T	T	T	T	T	T
T	F	T	F	T	F	T	F
T	F	F	T	T	T	T	T
T	F	F	F	T	F	T	F
F	T	T	T	T	T	F	T
F	T	T	F	T	T	F	F
F	T	F	T	T	T	F	T
F	T	F	F	T	T	F	F
F	F	T	T	T	T	F	T
F	F	T	F	T	F	F	F
F	F	F	T	T	T	F	T
F	F	F	F	T	F	F	F