

Quiz 2 Math 2510 Spring 2019

2) Prove S from premises $P \rightarrow Q$, $Q \rightarrow R$, $\neg R \vee S$, and P .

- 1 (1) $P \rightarrow Q$ Premise
- 2 (2) $Q \rightarrow R$ Premise
- 3 (3) $\neg R \vee S$ Premise
- 4 (4) P Premise
- 1, 2 (5) $P \rightarrow R$ 1, 2. Syllogism
- 1, 2, 4 (6) R 4, 5 \rightarrow -elimination
- 1, 2, 3, 4 (7) S 3, 6 propositional consequence

P	Q	R	S	$P \rightarrow Q$	$Q \rightarrow R$	$\neg R \vee S$	P	$P \rightarrow R$	R	S
T	T	T	T	T	T	F	T	T	T	T
T	T	T	F	T	T	T	T	T	T	F
T	T	F	T	T	F	T	T	F	F	T
T	T	F	F	T	F	T	T	F	F	F
T	F	T	T	F	T	T	F	F	F	T
T	F	T	F	F	T	T	F	F	F	F
T	F	F	T	F	F	T	F	F	F	T
T	F	F	F	F	F	T	F	F	F	F
F	T	T	T	T	T	F	F	T	T	T
F	T	T	F	T	T	T	F	T	T	F
F	T	F	T	T	F	T	F	F	F	T
F	T	F	F	F	F	T	F	F	F	F
F	F	T	T	T	T	T	F	T	F	T
F	F	T	F	T	T	T	F	T	F	F
F	F	F	T	T	F	T	F	F	F	T
F	F	F	F	F	F	T	F	F	F	F

Yes, S is a propositional consequence of $P \wedge (P \rightarrow Q)$

2) a) $P \wedge (P \rightarrow Q) \rightarrow Q$

P	Q	$P \wedge (P \rightarrow Q)$	$(P \wedge (P \rightarrow Q)) \rightarrow Q$
T	T	T	T
T	F	F	T
F	T	F	T
F	F	F	T

Yes, Q is a propositional consequence of $P \wedge (P \rightarrow Q)$

b) $\neg P \vee (P \rightarrow Q)$

P	Q	$\neg P \vee (P \rightarrow Q)$
T	T	F
T	F	F
F	T	T
F	F	T

$\neg P$ is not a propositional consequence of $\neg P \vee (P \rightarrow Q)$