

1. malas = p

bolos = q

lulus ujian = r

orangtua marah = s

premis :

$p \wedge q \rightarrow \neg r$

$\neg r \rightarrow s$

$q \wedge \neg s$

Kesimpulan : $\neg p$

• pembuktian dengan kaidah inferensi

1. $p \wedge q \rightarrow \neg r$ (premis)

2. $\neg r \rightarrow s$ (premis)

3. $q \wedge \neg s$ (premis)

4. $p \wedge q \rightarrow s$ (silogisme 1 dan 2)

5. $\neg s$ (simplifikasi 3)

6. $\neg p \vee \neg q$ (modus tollens 4)

7. q (simplifikasi 3)

8. $\neg q$ (disjungsi 7,8) , terbukti.

2. prove $\{p \rightarrow q, q \rightarrow r\} \models (q \rightarrow r) \rightarrow ((p \rightarrow \neg r) \rightarrow \neg p)$

a. validity checking

$p \quad q \quad r \quad ((p \rightarrow q) \wedge (q \rightarrow r)) \rightarrow ((q \rightarrow r) \rightarrow ((p \rightarrow \neg r) \rightarrow \neg p))$

T	T	T	T	T	T	T	F	T	F
T	T	F	T	F	F	T	T	F	F
T	F	T	F	F	T	T	F	T	F
T	F	F	F	F	T	T	T	T	T
F	T	T	T	T	T	F	T	T	T
F	T	F	T	F	F	T	T	T	T
F	F	T	T	T	T	T	T	T	T
F	F	F	T	T	T	T	T	T	T

maka pernyataan tersebut valid.

b. Unsatisfiability checking

(dilanjut di halaman berikutnya)

2. b. unsatisfiability checking

P	q	r	$(p \rightarrow q)$	\wedge	$(q \rightarrow r)$	\wedge	\sim	$((q \rightarrow r) \rightarrow$	$((p \rightarrow \sim r) \rightarrow$	$\sim p)$
T	T	T	T	T	T	F	F	T	T	F
T	T	F	T	F	F	F	F	T	T	F
T	F	T	F	F	T	F	F	T	F	F
T	F	F	F	F	T	F	T	F	T	F
F	T	T	T	T	T	F	F	T	T	T
F	T	F	T	F	F	F	F	T	T	T
F	F	T	T	T	T	F	F	T	T	T
F	F	F	T	T	T	F	F	T	T	T

maka statement tersebut unsatisfiable.

c. Axiom schemata

1. $p \rightarrow q \dots$ (premis)
2. $q \rightarrow r \dots$ (premis)
3. $(q \rightarrow r) \rightarrow (p \rightarrow (q \rightarrow r)) \dots$ (I1 2)
4. $p \rightarrow (q \rightarrow r) \dots$ (modus ponens 2,3)
5. $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r)) \dots$ (I10)
6. $(p \rightarrow q) \rightarrow (p \rightarrow r) \dots$ (modus ponens 2,3)
7. $p \rightarrow r \dots$ (modus ponens 6,1)
8. $(p \rightarrow \sim r) \rightarrow \sim p \dots$ (CR) dan modus ponens
9. $((p \rightarrow \sim r) \rightarrow \sim p) \rightarrow (q \rightarrow r) \rightarrow ((p \rightarrow \sim r) \rightarrow \sim p) \dots$ (I19)
10. $(q \rightarrow r) \rightarrow ((p \rightarrow \sim r) \rightarrow \sim p) \dots$ modus ponens

5. a. 1. $\{p, q\}$ 5. $\{p\}$ 1,4
 2. $\{\sim p, r\}$ 6. $\{\sim p\}$ 2,3
 3. $\{\sim p, \sim r\}$ 7. $\{\}$ 5,6
 4. $\{p, \sim q\}$

- b. 1. $\{p, q, \sim r, s\}$ 7. $\{\sim q\}$ 3,6
 2. $\{\sim p, r, s\}$ 8. $\{p, \sim r, s\}$ 1,7
 3. $\{\sim q, \sim r\}$ 9. $\{p, \sim r\}$ 4,8
 4. $\{p, \sim s\}$ 10. $\{\sim r\}$ 5,9
 5. $\{\sim p, \sim r\}$ 11. $\{\}$ 6,10
 6. $\{r\}$

6. 1. $\{\sim P, q\}$ premis
 2. $\{P, \sim T\}$ premis target : $\sim L \rightarrow S$
 3. $\{\sim r, s\}$ premis
 4. $\{\sim q, r\}$ premis
 5. $\{\sim P, r\}$ 1,4
 6. $\{r, \sim t\}$ 2,5
 7. $\{\sim t \rightarrow S\}$ 3,6 , terbukti

9. a) 1. $\sim b \wedge c$
 2. $\sim a \rightarrow \sim c$
 3. $c \wedge (\sim a \vee \sim b)$

b)	a	b	c	$\neg b \wedge c$	$\neg a \rightarrow \neg c$	$c \wedge (\neg a \vee \neg b)$
	T	T	T	F	T	F

beng jujur.

c)	a	b	c	$\neg b \wedge c$	$\neg a \rightarrow \neg c$	$c \wedge (\neg a \vee \neg b)$	$I \wedge II \wedge III$
	T	T	T	F	T	F	F
	T	T	F	F	T	T	F
	T	F	T	T	F	T	F
	T	F	F	F	F	T	F
	F	T	T	T	F	T	F
	F	T	F	T	T	T	T
	F	F	T	F	T	T	F
	F	F	F	T	F	T	F