

Sección 9.6

4. Demuestre el teorema 4, 24, 3

$$\vdash \oslash (\phi \wedge \text{true}) \equiv \phi$$

0. $(\phi \wedge \text{true})$

\equiv Regla de derivación \wedge -true >

1. $(\phi \equiv (\text{true} = (\phi \vee \text{true})) \wedge)$

\equiv Regla de asociatividad de \equiv >

2. $(\phi \equiv \text{true}) \equiv (\phi \vee \text{true})$

\equiv Identidad >

3. $(\phi \equiv (\phi \vee \text{true}))$

\equiv L. Identidad >

4. $(\phi \equiv \text{true})$

\equiv L. Identidad >

5. ϕ

MT 4, 2) $((\phi \wedge \text{true}) \equiv \phi)$

5. Demuestre el teorema 4, 24, 4

$$\vdash \oslash ((\phi \wedge \text{false}) \equiv \text{false})$$

0. $(\phi \wedge \text{false})$

= Regla de derivación \wedge -false >

1. $(\phi \equiv (\text{false} = (\phi \wedge \text{false}))) \wedge$

\equiv Identidad de \wedge >

2. $(\phi \equiv (\text{false} \wedge \phi))$

\equiv Regla de Comutatividad

3. $(\text{false} \equiv \phi) \equiv \phi$

\equiv Regla de Identidad >

4. $(\text{false} \equiv (\phi \equiv g))$

\equiv Teorema 4, 6, 2

5. $(\text{false} \equiv \text{true})$

\equiv Axioma 3

6. False

$(\phi \wedge \text{false}) \equiv \text{false}) \quad \text{MT 4, 21}$

b. Demuestre el teorema 4, 29, 5

$$\vdash_{\text{as}} ((\phi \wedge \psi) \equiv \phi)$$

0. $(\phi \wedge \psi)$

\equiv Regla de adición $\Psi : \phi$

1. $(\phi \equiv (\phi \wedge \psi)) \equiv ((\phi \wedge \psi) \wedge \phi)$

\equiv Regla de asociatividad

2. $((\phi \wedge \psi) \equiv ((\phi \wedge \psi) \wedge \phi))$

\equiv Vía idempotencia

3. $((\phi \equiv \phi) \equiv \phi)$

\equiv Teorema 4, 6, 2

4. $(\text{true} \equiv \phi)$

\equiv Comutatividad

5. $\phi \equiv \text{true}$

\equiv Identidad

6. $\phi \quad ((\phi \wedge \psi) \equiv \phi) \text{ MT 4, 21}$

c. Demuestre el teorema 4, 29, 1

$$\vdash_{\text{as}} ((\phi \wedge (\neg \phi)) \equiv \text{false})$$

0. $(\phi \wedge (\neg \phi))$

\equiv Regla de adición $\Psi : (\neg \phi)$

1. $\phi \equiv ((\neg \phi) \wedge (\neg \phi)) \equiv ((\neg \phi) \wedge \phi)$

\equiv demo 1

2. $\phi \equiv ((\neg \phi) \equiv \text{true})$

\equiv Identidad

3. $(\phi \equiv (\neg \phi))$

\equiv Teorema 4, 15, 7

4. Falso

Demo 1

0. $\phi \vee (\neg \phi) \quad \text{T. 4, 10, 1}$

1. $(\phi \vee \neg \phi) \equiv \text{true}$ Identidad

$$((\phi \wedge (\neg \phi)) \equiv \text{false}) \text{ MT 4, 21}$$

9. Demuestre el teorema 4.25.2

$$\vdash_{\text{D5}} \underbrace{((\neg(\phi \wedge \psi)))}_{p} \equiv \underbrace{((\neg\phi) \vee (\neg\psi))}_{q \quad r}$$

0. ϕ

\equiv Identidad \rightarrow

1. $\phi \equiv \text{true}$

\equiv Leibniz $\phi(p \equiv \text{true})$

$$2. (\phi \vee \text{true}) \equiv (\text{true} \vee \text{true})$$

\equiv Teorema 4.19.2

3. $\text{true} \equiv \text{true}$

\equiv Leibniz $\phi(p \equiv \text{true})$

$$4. ((\text{true} \equiv \text{true}) \equiv \text{true})$$

\equiv Leibniz $p \equiv \text{true} \quad q: p \equiv (\psi \vee \gamma)$

$$5. (((\text{true} \equiv (\psi \vee \gamma)) \equiv \text{true}) \equiv (\psi \vee \gamma)) \equiv \text{true}$$

\equiv Identidad

$$6. ((\psi \vee \gamma) \equiv (\psi \vee \gamma)) \equiv \text{true}$$

\equiv Axioma de identidad, Leibniz $\phi(p \equiv \text{true})$

$$7. ((\psi \vee \gamma) \equiv ((\psi \vee \tau) \equiv \text{true}))$$

\equiv Leibniz $p: ((\psi \vee \gamma) \equiv \text{true}) \quad q: p \equiv \text{true}$

$$8. ((\psi \vee \tau) \equiv ((\psi \vee \tau) \equiv \text{true})) \equiv (\text{true} \vee \text{true}))$$

\equiv Teorema 4.19.2

$$9. ((\psi \vee \gamma) \equiv (\text{true} \equiv \text{true}))$$

\equiv Identidad

$$10. ((\psi \vee \gamma) \equiv \text{true})$$

\equiv Identidad

$$11. (\psi \vee \gamma)$$

\equiv Teorema 4.21

$$12. \phi \equiv (\psi \vee \gamma)$$

\equiv Intuición + teorema: $\phi: ((\neg(\phi \wedge \psi))) \vdash_{\text{D5}} \neg(\phi) \vee \neg(\psi)$

$$13. ((\neg(\phi \wedge \psi))) \equiv ((\neg\phi) \vee (\neg\psi))$$

11 Demuestre el teorema 4, 25, 9

$$1 \vdash_{\text{D}} ((\phi \wedge (\psi \equiv \gamma)) \equiv ((\phi \wedge \psi) \equiv (\phi \wedge \gamma) \equiv \phi))$$

$$0. ((\phi \wedge (\psi \equiv \gamma)))$$

\equiv L Regla de definición $\psi : (\psi \equiv \gamma) \triangleright$

$$1. \phi \equiv ((\psi \equiv \gamma) \equiv (\phi \vee (\psi \equiv \gamma)))$$

\equiv L Regla distributiva, la equivalencia

$$2. \phi \equiv ((\psi \equiv \gamma) \equiv ((\phi \vee \psi) \equiv (\phi \vee \gamma)))$$

\equiv L Regla Asociativa $\phi : \phi \vee \psi \triangleright \gamma \triangleright$

$$3. ((\phi \equiv \psi) \equiv \gamma) \equiv ((\phi \vee \psi) \equiv (\phi \vee \gamma))$$

\equiv L Regla Asociativa $\phi : (\phi \equiv \gamma) \triangleright \psi : \gamma \triangleright ((\phi \vee \psi)$

$$4. ((\phi \equiv \psi) \equiv (\gamma \equiv ((\phi \vee \psi) \equiv (\phi \vee \gamma)))) \equiv (\phi \vee \gamma)$$

\equiv L Regla Comunitativa, $\phi : \gamma \triangleright \psi : (\phi \vee \psi)$

$$5. ((\phi \equiv \psi) \equiv ((\phi \vee \psi) \equiv \gamma)) \equiv (\phi \vee \gamma)$$

\equiv L Regla Propiedad $\phi : ((\phi \equiv \psi) \equiv (\phi \vee \psi)) \triangleright \gamma : (\phi \vee \gamma)$

$$6. ((\phi \equiv \psi) \equiv (\phi \vee \psi)) \equiv (\gamma \equiv ((\phi \vee \psi) \equiv \gamma))$$

\equiv L Regla Asociativa, $\phi : \phi \vee \psi \triangleright \gamma : (\phi \vee \psi)$

$$7. ((\phi \equiv (\psi \equiv ((\phi \vee \psi) \equiv \gamma))) \equiv (\gamma \equiv ((\phi \vee \gamma) \equiv \gamma)))$$

\equiv L Regla Propiedad, Comunitativa

$$8. ((\phi \equiv \psi) \equiv (\gamma \equiv ((\phi \vee \psi) \equiv \gamma)))$$

\equiv L Regla, $\phi : \phi \in P$

$$9. ((\phi \equiv (\psi \wedge \gamma)) \equiv (\phi \equiv (\gamma \equiv ((\phi \wedge \psi) \equiv \gamma))))$$

\equiv L Regla de definición, Comunitativa

$$10. ((\phi \equiv (\phi \wedge \gamma)) \equiv (\phi \wedge \gamma))$$

\equiv L Regla Asociativa $\phi : \phi \wedge \gamma : (\phi \wedge \gamma), \gamma : (\phi \wedge \gamma)$

$$11. (\phi \equiv ((\phi \wedge \gamma) \equiv (\phi \wedge \gamma)))$$

\equiv L Regla Comunitativa $\phi : \phi \wedge \gamma : ((\phi \wedge \gamma) \equiv (\phi \wedge \gamma))$

$$12. ((\phi \wedge \gamma) \equiv (\phi \wedge \gamma)) \equiv \phi$$

$$((\phi \wedge (\psi \equiv \gamma))) \equiv ((\phi \wedge \psi) \equiv (\phi \wedge \gamma) \equiv \phi) \quad M7 9,29.$$

12. Demuestra el teorema 4,25,5

$$\vdash \text{as } ((\phi \wedge (\psi \neq \tau)) \equiv \underbrace{((\phi \wedge \psi)}_{\phi} \neq \underbrace{(\phi \wedge \tau)}_{\tau}))$$

0. \emptyset

\equiv Identidad

1. $\phi \equiv \text{true}$

\equiv Leibniz $\phi = \rho \vee \text{true}$

2. $((\phi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$

\equiv Teorema 4,19,2

3. $\text{true} \equiv \text{true}$

\equiv Leibniz $\rho : \text{true} \quad \phi : \rho \equiv \text{true}$

4. $(\text{true} \equiv \text{true}) \equiv \text{true}$

\equiv Leibniz $\rho : \text{true} \quad \phi : \rho \equiv (\psi \neq \tau)$

5. $((\text{true} \equiv (\psi \neq \tau)) \equiv (\text{true} \equiv (\psi \neq \tau))) \equiv \text{true}$

\equiv Identidad

6. $((\psi \neq \tau) \equiv (\psi \neq \tau)) \equiv \text{true}$

\equiv Regla "anotar el resultado"

7. $((\psi \neq \tau) \equiv ((\psi \neq \tau) \equiv \text{true}))$

\equiv Leibniz $\rho : ((\psi \neq \tau) \equiv \text{true}) \quad \phi : \rho \vee \text{true}$

8. $((\psi \neq \tau) \equiv ((\psi \neq \tau) \vee \text{true})) \equiv \text{true}$

\equiv q,19,2

9. $((\psi \neq \tau) \equiv (\text{true} \equiv \text{true}))$

\equiv Identidad

10. $((\psi \neq \tau) \equiv \text{true})$

\equiv Identidad

11. $(\psi \equiv \tau)$

\equiv Teorema 4,21

12. $(\phi \equiv (\psi \neq \tau))$

Sustitución universal $\phi : ((\phi \wedge (\psi \neq \tau))) \quad \psi : (\phi \wedge \psi)$

13. $((\phi \wedge (\psi \neq \tau)) \rightarrow ((\phi \wedge \psi) \neq (\phi \wedge \tau)))$

Section 4.7

$$3. 1 \text{ is } ((\underbrace{\phi \rightarrow \psi}) \equiv (\underbrace{(\phi \wedge \psi) \equiv \phi}))$$

0. ϕ

\equiv identid

1. $\phi \equiv \text{true}$

\equiv Leibniz $\phi \cdot \phi \vee \text{true}$

2. $((\phi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$
 \equiv Teorema 4.1a, 2

3. $(\text{true} \equiv \text{true})$

\equiv Leibniz $\rho: \text{true} \quad \phi: \text{true} \wedge \rho$

4. $((\text{true} \equiv \text{true}) \equiv \text{true})$

\equiv Leibniz $\rho: \text{true} \quad \phi: (\rho \equiv (\psi \equiv \gamma))$

5. $((\text{true} \equiv (\psi \equiv \gamma)) \equiv (\text{true} \equiv (\psi \equiv \gamma))) \equiv \text{true}$
 \equiv identid

6. $((\psi \equiv \gamma) \equiv (\psi \equiv \gamma)) \equiv \text{true}$

\equiv Regla asociatividad

7. $(\psi \equiv \gamma) \equiv ((\psi \equiv \gamma) \equiv \text{true})$

\equiv Leibniz $\rho: ((\psi \equiv \gamma) \equiv \text{true}) \cdot \phi: \rho \vee \text{true}$

8. $((\psi \equiv \gamma) \equiv ((\psi \equiv \gamma) \vee \text{true})) \equiv (\text{true} \vee \text{true})$
 \equiv Teorema 4.1a, 2

9. $((\psi \equiv \gamma) \equiv (\text{true} \equiv \text{true}))$

\equiv identid

10. $((\psi \equiv \gamma) \equiv \text{true})$

\equiv identid

11. $(\psi \equiv \gamma)$

\equiv Teorema 4.1a, 2

12. $(\phi \equiv \psi \equiv \top)$

Sustitucion tentativa $\phi: (\phi \rightarrow \psi) \cdot \psi: (\phi \vee \psi)$

13. $((\phi \rightarrow \psi) \equiv ((\phi \vee \psi) \equiv \phi))$

7. Demuestre el teorema 9,29,4

$$\vdash_{\text{os}} ((\phi \rightarrow \text{false}) \equiv (\neg \phi))$$

$$0. \phi$$

\equiv Identidad >

$$1. \phi \equiv \text{true}$$

\equiv Leibniz $\phi : p \vee \text{true}$

$$2. ((\phi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$$

\equiv Teorema 9,1a,2

$$3. (\text{true} \equiv \text{true})$$

\equiv Leibniz $p : \text{true} \quad \phi : p \equiv \text{true}$

$$4. (\text{true} \equiv \text{true}) \equiv \text{true}$$

\equiv Leibniz $p : \text{true} \quad \phi : p \equiv \psi$

$$5. ((\text{true} \equiv \psi) \equiv (\text{true} \equiv \psi)) \equiv \text{true}$$

\equiv Identidad

$$6. (\psi \equiv \psi) \equiv \text{true}$$

\equiv Regla Asociativa

$$7. (\psi \equiv ((\psi \equiv \text{true}) \equiv \text{true}))$$

\equiv Leibniz $\psi : \psi \equiv \text{true} \quad \phi : p \vee \text{true}$

$$8. ((\psi \equiv ((\psi \vee \text{true}) \equiv (\text{true} \vee \text{true}))) \equiv \text{true})$$

\equiv Teorema 9,1a,2 11

$$9. (\psi \equiv (\text{true} \equiv \text{true}))$$

\equiv Identidad

$$10. (\psi \equiv \text{true})$$

\equiv Identidad

$$11. \psi$$

MT 9,21

$$12. \phi \equiv \psi$$

Siguiendo textos $\phi : ((\phi \rightarrow \text{false}) \vee \psi : (\neg \phi))$

$$13. ((\phi \rightarrow \text{false}) \equiv (\neg \phi))$$

10. Demontre el teorema 4,30,3

$$1 \xrightarrow{\text{as}} ((\phi \rightarrow (\psi \wedge \gamma)) \equiv ((\phi \rightarrow \psi) \wedge (\phi \rightarrow \gamma))$$

0. d

\equiv identidad

1. $\phi \equiv \text{true}$

\equiv Leibniz $\phi : p \text{ true}$

2. $((\phi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$

\equiv teorema 4,19,2

3. $\text{true} \equiv \text{true}$

\equiv identidad

4. $(\text{true} \equiv \text{true}) \equiv \text{true}$

\equiv Leibniz $p : \text{true} \quad \phi : p \equiv \psi$

5. $((\text{true} \equiv \psi) \equiv (\text{true} \equiv \psi)) \equiv \text{true}$

\equiv Identidad

6. $((\psi \equiv \psi) \equiv \text{true})$

\equiv Asociatividad

7. $\psi \equiv (\psi \equiv \text{true})$

\equiv Leibniz $p : \psi \equiv \text{true} \quad q : p \vee \text{true}$

8. $\psi \equiv ((\psi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$

\equiv Teorema 4,19,2

9. $\psi \equiv (\text{true} \equiv \text{true})$

\equiv Identidad

10. $\psi \equiv \text{true}$

\equiv identidad

11. ψ

\equiv Teorema 4,21

12. $\phi \equiv \psi$

Substitution textual $\phi : (\phi \rightarrow (\psi \wedge \gamma))$

$\psi : ((\phi \rightarrow \psi) \wedge (\phi \rightarrow \gamma))$

13. $((\phi \rightarrow (\psi \wedge \gamma)) \equiv ((\phi \rightarrow \psi) \wedge (\phi \rightarrow \gamma)))$

17. Demuestre el teorema 4.31.5

$$\vdash \text{as } ((\phi \rightarrow (\psi \rightarrow \gamma)) = ((\phi \wedge \psi) \rightarrow \gamma))$$

$$0 \quad \phi \quad \phi$$

\equiv Identidad

$$1 \quad \phi \equiv \text{true}$$

\equiv Leibniz p: true

$$2 \quad (\phi \vee \text{true}) \equiv (\text{true} \vee \text{true})$$

\equiv Teorema 4.1a, 2

$$3 \quad \text{true} \equiv \text{true}$$

\equiv Identidad

$$4 \quad (\text{true} \equiv \text{true}) \equiv \text{true}$$

\equiv Leibniz p: true, $\phi: p \equiv \psi$

$$5 \quad ((\text{true} \equiv \psi) \equiv (\text{true} \equiv \psi)) \equiv \text{true}$$

\equiv Identidad

$$6 \quad ((\psi \equiv \psi) \equiv \text{true})$$

\equiv Asociatividad

$$7 \quad \psi \equiv (\psi \equiv \text{true})$$

\equiv Leibniz p: $\psi \equiv \text{true}$, $p: p \equiv \text{true}$

$$8 \quad \psi \equiv ((\psi \vee \text{true}) \equiv (\text{true} \vee \text{true}))$$

\equiv Teorema 4.1a, 2

$$9 \quad \psi \equiv (\text{true} \equiv \text{true})$$

\equiv Identidad

$$10 \quad ((\psi \equiv \text{true}))$$

\equiv Identidad

$$11 \quad \psi$$

\equiv M7 4.21

$$12 \quad \phi = \psi$$

\equiv Subs: función textual: $\phi: (\phi \rightarrow (\psi \rightarrow \gamma))$

$$\psi: ((\phi \wedge \psi) \rightarrow \gamma)$$

$$13 \quad ((\phi \rightarrow (\psi \rightarrow \gamma)) \wedge ((\phi \wedge \psi) \rightarrow \gamma))$$

39. Demuestre el Teorema 4,35,5

$$\vdash \text{ps } ((\phi \vee \psi) \rightarrow \gamma) = ((\phi \rightarrow \gamma) \wedge (\psi \rightarrow \gamma)) \vee$$

$\underbrace{\phi}_{\rho}$ $\underbrace{\psi}_{\Psi}$

0. \emptyset

\equiv identidad

1. $\phi \in \text{true}$

\equiv Leibniz $\phi : \text{true}$, $\psi : \phi \vee \text{true}$

2. $(\phi \vee \text{true}) \in \text{true}$

\equiv Leibniz $\phi : \text{true}$, $\phi : \phi \vee \text{true}$

3. $((\phi \vee \text{true})) \in (\text{true} \wedge \text{true})$

\equiv Teorema 4,1k,2 en $\phi : \phi \vee \text{true}$, $\psi : \text{true} \wedge \text{true}$

4. $\text{true} \in \text{true}$

\equiv Identidad

5. $(\text{true} \equiv \text{true}) \in \text{true}$

\equiv Leibniz $\phi : \text{true}$, $\psi : \phi \equiv \psi$

6. $(\text{true} \equiv \psi) = ((\text{true} \equiv \psi) \wedge \text{true}) \in \text{true}$

\equiv Identidad en $\phi : \text{true} \equiv \psi$

7. $(\psi \equiv \psi) \in \text{true}$

\equiv Asociatividad

8. $\psi \equiv (\psi \equiv \text{true})$

\equiv Leibniz $\phi : \psi$, $\phi : \phi \vee \text{true}$

9. $\psi \in ((\psi \vee \text{true}) \equiv \text{true})$

\equiv Leibniz $\phi : \text{true}$, $\phi : \phi \vee \text{true}$

10. $\psi \in ((\psi \vee \text{true}) \equiv (\text{true} \wedge \text{true}))$

\equiv Teorema 4,1g,2 en $\phi : (\psi \vee \text{true})$

11. $\psi \in (\text{true} \equiv \text{true})$

\equiv Identidad

12. $\psi \in (\text{true})$

\equiv Identidad

13. ψ

\equiv MT 4,21

14. $\phi \equiv \psi$

33. Demuestre el Teorema 4,3g,3

$$\vdash \text{ps } (((\phi \equiv \psi) \wedge (\psi \rightarrow \gamma)) \rightarrow (\phi \rightarrow \gamma))$$

0. $((\phi \equiv \psi) \wedge (\psi \rightarrow \gamma))$

$\leftarrow (\phi \equiv \psi) \rightarrow (\phi \rightarrow (\phi \rightarrow \gamma))$

1. $(\phi \rightarrow \psi) \wedge (\psi \rightarrow \gamma)$

$\leftarrow ((\phi \rightarrow \psi) \wedge (\psi \rightarrow \gamma)) \rightarrow (\phi \rightarrow \gamma)$

2. $(\phi \rightarrow \gamma)$

5.1. Sección

4. Elimine tantas paréntesis como sea posible.

$$a. ((\phi \vee (\psi \vee \tau)) \equiv ((\phi \vee \psi) \vee \tau))$$

$$(\phi \vee \psi \vee \tau) \equiv (\phi \vee \psi \vee \tau)$$

$$f. ((\neg \phi) \equiv (\phi \equiv \text{false}))$$

$$\neg \phi \equiv (\phi \equiv \text{false})$$

$$m. ((\phi \equiv (\neg \phi)) \equiv \text{false})$$

$$(\phi \equiv (\neg \phi)) \equiv \text{false}$$

$$t. ((\phi \rightarrow \psi) \equiv ((\phi \vee \psi) \equiv \psi))$$

$$(\phi \rightarrow \psi \equiv (\phi \vee \psi = \psi))$$

$$w. ((\phi \rightarrow (\psi \vee \tau)) \equiv ((\phi \rightarrow \psi) \vee (\phi \rightarrow \tau)))$$

$$(\phi \rightarrow \psi \vee \tau) \equiv (\phi \rightarrow \psi \vee \phi \rightarrow \tau)$$

$$x. ((\phi \rightarrow (\psi \wedge \tau)) \equiv (\phi \rightarrow \psi) \wedge (\phi \rightarrow \tau))$$

$$(\phi \rightarrow \psi \wedge \tau) \equiv (\phi \rightarrow \psi \wedge \phi \rightarrow \tau)$$

$$z. (((\phi \vee \psi) \rightarrow (\phi \wedge \psi)) \equiv (\phi = \psi))$$

$$(\phi \vee \psi) \rightarrow \phi \wedge \psi \equiv (\phi = \psi)$$

2. Determina si las siguientes expresiones son ambigüas, si lo es, póngatela.

$$a. p \vee q \wedge r \text{ Amb.}$$

$$(p \vee q) \wedge r$$

$$d. p \rightarrow q \leftarrow r \text{ Amb.}$$

$$(p \rightarrow q) \leftarrow r$$

$$b. p \wedge q \vee r \text{ Amb.}$$

$$(p \wedge q) \vee r$$

$$e. p \wedge q \rightarrow r \text{ Amb.}$$

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

$$c. p \rightarrow q \rightarrow r \text{ No es amb.}$$

5. Considera las siguientes expresiones, ponente lógica de verdad que son tautologías

a. true $\vee p \wedge q$ true $\vee (p \wedge q)$

true	p	q	$p \wedge q$	$\text{true} \vee (p \wedge q)$
T	I	F	F	T
T	F	T	F	T
I	T	F	F	T
I	T	T	T	T

b. $\varphi = p \vee q$ $(p \equiv p) \vee q$

p	q	$(p \equiv p)$	$(p \equiv p) \vee q$
T	T	T	T
T	F	T	T
F	T	T	T
F	F	T	T

c. $((p \rightarrow q \equiv r) \equiv (p \wedge q)) \equiv (p \wedge r)$

p	q	r	$p \rightarrow q$	$(p \rightarrow (q \equiv r))$	$p \wedge q$	$p \wedge r$	$m = n$	$m \neq n$	$o = p$	$o \neq p$
T	T	T	T	T	T	T	T	T	T	F
T	T	F	F	F	T	F	F	F	F	T
T	F	T	F	F	F	F	F	F	F	T
T	F	F	F	F	F	F	F	F	F	T
F	T	T	T	T	F	F	F	F	F	T
F	T	F	F	F	F	F	F	F	F	T
F	F	T	T	T	F	F	F	F	F	T
F	F	F	T	F	F	F	F	F	F	T

$((p \rightarrow (q \equiv r)) \equiv ((p \wedge q) \equiv (p \wedge r)))$