

15, 19 or 24 **VALID** Categorical Syllogisms

Table	Figure	Name
1	I	bArbArA
2	I	cElArEnt
3	I	dArII
4	I	fEriO
5	II	cEsArE
6	II	cAmEstrEs
7	II	bArOcO
8	II	fEstInO
9*	III	dArAptI
10	III	dAtIsl
11	III	dlsAmls
12*	III	fElAptOn
13	III	bOcArdO
14	III	fErIsOn
15*	IV	brAmAntIp
16	IV	dImArIs
17	IV	cAmEnEs
18*	IV	fEsApO
19	IV	frEsIsOn
20*	I	(from 1; bArbArI)
21*	I	(from 2; cElArOnt)
22*	II	(from 5; cEsArO))
23*	II	(from 6; cAmEstrOs)
24*	IV	(from 17; cAmEnOs)

*requires existential import (EI) for validity

I-AAA	(bArBArA)		III-OAO	(bOcArdO)	
	All Q are R.			Some Q are not R.	
	All P are Q.			All Q are P.	
1	Therefore, all P are R.		13	Therefore, some P are not R.	
	$(\forall x)(Qx > Rx)$			$(\exists x)(Qx \wedge \neg Rx)$	
	$(\forall x)(Px > Qx)$			$(\forall x)(Qx > Px)$	
	$(\forall x)(Px > Rx)$			$(\exists x)(Px \wedge \neg Rx)$	
I-EAE	(cElArEnt)		III-EIO	(fErIsOn)	
	All Q are not R.			All Q are not R.	
	All P are Q.			Some Q are P.	
2	Therefore, all P are not R.		14	Therefore, some P are not R.	
	$(\forall x)(Qx > \neg Rx)$			$(\forall x)(Qx > \neg Rx)$	
	$(\forall x)(Px > Qx)$			$(\exists x)(Qx \wedge Px)$	
	$(\forall x)(Px > \neg Rx)$			$(\exists x)(Px \wedge \neg Rx)$	
I-AII	(dArII)		IV-AAI	(brAmAntip)	
	All Q are R.			All R are Q.	
	Some P are Q.			All Q are P.	
3	Therefore, some P are R.		15	Therefore, some P are R.	
	$(\forall x)(Qx > Rx)$			$(\forall x)(Rx > Qx)$	
	$(\exists x)(Px \wedge Qx)$			$(\forall x)(Qx > Px)$	
	$(\exists x)(Px \wedge Rx)$			$(\exists x)(Px \wedge Rx)$	
I-EIO	(fErIO)		IV-IAI	(dlmArIs)	
	All Q are not R.			Some R are Q.	
	Some P are Q.			All Q are P.	
4	Therefore, some P are not R.		16	All Q are P.	
	$(\forall x)(Qx > \neg Rx)$			Therefore, some P are R.	
	$(\exists x)(Px \wedge Qx)$			$(\exists x)(Rx \wedge Qx)$	
	$(\exists x)(Px \wedge \neg Rx)$			$(\forall x)(Qx > Px)$	
				$(\exists x)(Px \wedge Rx)$	
II-EAE	(cEsArE)		IV-AEE	(cAmEnEs)	
	All R are not Q.			All R are Q.	
	All P are Q.			All Q are not P.	
5	Therefore, all P are not R.		17	Therefore, all P are not R.	
	$(\forall x)(Rx > \neg Qx)$			$(\forall x)(Rx > Qx)$	
	$(\forall x)(Px > Qx)$			$(\forall x)(Qx > \neg Px)$	
	$(\forall x)(Px > \neg Rx)$			$(\forall x)(Px > \neg Rx)$	

II-AEE (cAmEstrEs)

All R are Q.

All P are not Q.

6 Therefore, all P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Px > Qx)$ $(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AOO (bArOcO)

All R are Q.

Some P are not Q.

7 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow Q$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-EIO (fEstInO)

All R are not Q.

Some P are Q.

8 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge Q$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AAI (dArApTl)

All Q are R.

All P are Q.

9 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AII (dAtsl)

All Q are R.

Some Q are P.

10 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\exists x)(Qx \wedge Px)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

IV-EAO (fEsApO)

All R are not Q.

All Q are P.

IV-EAO (fEsApO)

All R are not Q.

All Q are P.

18 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$Q \Rightarrow P$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

IV-EIO (frEsIsOn)

All R are not Q.

Some Q are P.

19 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Qx \wedge Px)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$Q \wedge P$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AAI (bArBArI)

All Q are R.

All P are Q.

20 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EAO (cElArOnt)

All Q are not R.

All P are Q.

21 Therefore, some P are not R.

 $(\forall x)(Qx > \neg Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow \neg R$	$P \Rightarrow Q$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-EAO (cEsArO)

All R are not Q.

All P are Q.

22 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow Q$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	

III-IAI (dIsAmls)

Some Q are R.

All Q are P.

11 Therefore, some P are R.

$(\exists x)(Qx \wedge Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge R$	$Q > P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-EAO (fElAptOn)

All Q are not R.

All Q are P.

12 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q > \sim R$	$Q > P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-AEO (cAmEstrOs)

All R are Q.

All P are not Q.

23 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > \sim Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R > Q$	$P > \sim Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

IV-AEO (cAmEnOs)

All R are Q.

All Q are not P.

24 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R > Q$	$Q > \sim P$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

I-AAA (bArBArA)

All Q are R.
All P are Q.

1 Therefore, all P are R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Px > Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	TRUE	FALSE	TRUE
4	1	0	0	TRUE	FALSE	FALSE
5	0	1	1	TRUE	TRUE	TRUE
6	0	1	0	FALSE	TRUE	TRUE
7	0	0	1	TRUE	TRUE	TRUE
8	0	0	0	TRUE	TRUE	TRUE

I-EAE (cElArEnt)

All Q are not R.
All P are Q.

2 Therefore, all P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\forall x)(Px > Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow \neg R$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	TRUE	TRUE
6	0	1	0	TRUE	TRUE	TRUE
7	0	0	1	TRUE	TRUE	TRUE
8	0	0	0	TRUE	TRUE	TRUE

I-II (dArII)

All Q are R.
Some P are Q.

3 Therefore, some P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	TRUE	FALSE	TRUE
4	1	0	0	TRUE	FALSE	FALSE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	FALSE	FALSE	FALSE
7	0	0	1	TRUE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

I-EIO (fErIO)

All Q are not R.
Some P are Q.

4 Therefore, some P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$P \wedge Q$	$P \wedge \neg R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	TRUE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

II-EAE (cEsArE)

All R are not Q.
All P are Q.

5 Therefore, all P are not R.

$(\forall x)(Rx > \neg Qx)$
 $(\forall x)(Px > Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	TRUE	TRUE
6	0	1	0	TRUE	TRUE	TRUE
7	0	0	1	TRUE	TRUE	TRUE
8	0	0	0	TRUE	TRUE	TRUE

III-OAO (bOcArdO)

Some Q are not R.

All Q are P.

13 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow P$	$P \wedge \neg R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	FALSE	TRUE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	FALSE	TRUE	FALSE
8	0	0	0	FALSE	TRUE	FALSE

III-EIO (fErIsOn)

All Q are not R.

Some Q are P.

14 Therefore, some P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$Q \wedge P$	$P \wedge \neg R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	TRUE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

IV-AAI (brArMAntlp)

All R are Q.

All Q are P.

15 Therefore, some P are R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	TRUE	TRUE	FALSE
3	1	0	1	FALSE	TRUE	TRUE
4	1	0	0	FALSE	TRUE	FALSE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	FALSE	TRUE	FALSE
8	0	0	0	FALSE	TRUE	FALSE

IV-AEI (cAmEnEs)

All R are Q.

All Q are not P.

17 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Qx > \neg Px)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	TRUE	FALSE	FALSE
2	1	1	0	TRUE	FALSE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	TRUE	TRUE	TRUE
6	0	1	0	TRUE	TRUE	TRUE
7	0	0	1	FALSE	TRUE	TRUE
8	0	0	0	TRUE	TRUE	TRUE

II-AEE (cAmEstrEs)

All R are Q.

All P are not Q.

6 Therefore, all P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow Q$	$P = \sim Q$	$P \Rightarrow \sim R$
1	1	1	1	TRUE	FALSE	FALSE
2	1	1	0	TRUE	FALSE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	TRUE	TRUE	TRUE
6	0	1	0	TRUE	TRUE	TRUE
7	0	0	1	FALSE	TRUE	TRUE
8	0	0	0	TRUE	TRUE	TRUE

II-AOO (bArOcO)

All R are Q.

Some P are not Q.

7 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge \sim Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$P \wedge \sim Q$	$P \wedge \sim R$
1	1	1	1	TRUE	FALSE	FALSE
2	1	1	0	TRUE	FALSE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	FALSE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

II-EIO (fEstInO)

All R are not Q.

Some P are Q.

8 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge \sim Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$P \wedge Q$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	TRUE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

III-AAI (dArApTl)

All Q are R.

All Q are P.

9 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	TRUE	TRUE	TRUE
4	1	0	0	TRUE	TRUE	FALSE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	FALSE	FALSE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

III-AII (dAtIsI)

All Q are R.

Some Q are P.

10 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	TRUE	FALSE	TRUE
4	1	0	0	TRUE	FALSE	FALSE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	FALSE	FALSE	FALSE
7	0	0	1	TRUE	FALSE	FALSE
8	0	0	0	TRUE	FALSE	FALSE

IV-EAO (fEsApO)

All R are not Q.

All Q are P.

18 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$Q \Rightarrow P$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

IV-EIO (frEsIsOn)

All R are not Q.

Some Q are P.

19 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	TRUE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

I-AAI (bArBArI)

All Q are R.

All P are Q.

20 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	TRUE	FALSE	TRUE
4	1	0	0	TRUE	FALSE	FALSE
5	0	1	1	TRUE	TRUE	FALSE
6	0	1	0	FALSE	TRUE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

I-EAO (cElArOnt)

All Q are not R.

All P are Q.

21 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow Q$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	TRUE	FALSE
6	0	1	0	TRUE	TRUE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

II-EAO (cEsArO)

All R are not Q.

All P are Q.

22 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$P \Rightarrow Q$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	FALSE	FALSE
4	1	0	0	TRUE	FALSE	TRUE
5	0	1	1	FALSE	TRUE	FALSE
6	0	1	0	TRUE	TRUE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

III-IAI (dlsAmls)

Some Q are R.
All Q are P.

11 Therefore, some P are R.

$(3x)(Qx \wedge Rx)$
 $(\forall x)(Qx > Px)$
 $(3x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \wedge R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	TRUE	TRUE	TRUE
2	1	1	0	FALSE	TRUE	FALSE
3	1	0	1	FALSE	TRUE	TRUE
4	1	0	0	FALSE	TRUE	FALSE
5	0	1	1	TRUE	FALSE	FALSE
6	0	1	0	FALSE	FALSE	FALSE
7	0	0	1	FALSE	TRUE	FALSE
8	0	0	0	FALSE	TRUE	FALSE

III-EAO (fElAptOn)

All Q are not R.
All Q are P.

12 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$
 $(\forall x)(Qx > Px)$
 $(3x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow P$	$P \wedge \sim R$
1	1	1	1	FALSE	TRUE	FALSE
2	1	1	0	TRUE	TRUE	TRUE
3	1	0	1	TRUE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	FALSE	FALSE	FALSE
6	0	1	0	TRUE	FALSE	FALSE
7	0	0	1	TRUE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

II-AEO (cAmEstrOs)

All R are Q.
All P are not Q.

23 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Px > \sim Qx)$
 $(3x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \sim Q$	$P \wedge \sim R$
1	1	1	1	TRUE	FALSE	FALSE
2	1	1	0	TRUE	FALSE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	TRUE	TRUE	FALSE
6	0	1	0	TRUE	TRUE	FALSE
7	0	0	1	FALSE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

IV-AEO (cAmEnOs)

All R are Q.
All Q are not P.

24 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Qx > \sim Px)$
 $(3x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow \sim P$	$P \wedge \sim R$
1	1	1	1	TRUE	FALSE	FALSE
2	1	1	0	TRUE	FALSE	TRUE
3	1	0	1	FALSE	TRUE	FALSE
4	1	0	0	TRUE	TRUE	TRUE
5	0	1	1	TRUE	TRUE	FALSE
6	0	1	0	TRUE	TRUE	FALSE
7	0	0	1	FALSE	TRUE	FALSE
8	0	0	0	TRUE	TRUE	FALSE

I-AAA (bArBArA)

All Q are R.

All P are Q.

1 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-EAE (cElArEnt)

All Q are not R.

All P are Q.

2 Therefore, all P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow Q$	$P \Rightarrow \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-AII (dArII)

All Q are R.

Some P are Q.

3 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EIO (fErIO)

All Q are not R.

Some P are Q.

4 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge Q$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EAE (cEsArE)

All R are not Q.

All P are Q.

5 Therefore, all P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow \sim Q$	$P \Rightarrow Q$	$P \Rightarrow \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-OAO (bOcArdO)

Some Q are not R.

All Q are P.

13 Therefore, some P are not R.

$(\exists x)(Qx \wedge \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \wedge \sim R$	$Q \Rightarrow P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-EIO (fErIsOn)

All Q are not R.

Some Q are P.

14 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	1	0	0

IV-AAI (brArMAntlp)

All R are Q.

All Q are P.

15 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \wedge Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

IV-AEE (cAmEnEs)

All R are Q.

All Q are not P.

17 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow \sim P$	$P \Rightarrow \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AEE (cAmEstrEs)

All R are Q.

All P are not Q.

6 Therefore, all P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Px > Qx)$ $(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AOO (bArOcO)

All R are Q.

Some P are not Q.

7 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow Q$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-EIO (fEstInO)

All R are not Q.

Some P are Q.

8 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge Q$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AAI (dArApTl)

All Q are R.

All Q are P.

9 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AII (dAtsl)

All Q are R.

Some Q are P.

10 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\exists x)(Qx \wedge Px)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

IV-EAO (fEsApO)

All R are not Q.

All Q are P.

18 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$Q \Rightarrow P$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

IV-EIO (frEsIsOn)

All R are not Q.

Some Q are P.

19 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Qx \wedge Px)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$Q \wedge P$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AAI (bArBArI)

All Q are R.

All P are Q.

20 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EAO (cElArOnt)

All Q are not R.

All P are Q.

21 Therefore, some P are not R.

 $(\forall x)(Qx > \neg Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow \neg R$	$P \Rightarrow Q$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-EAO (cEsArO)

All R are not Q.

All P are Q.

22 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

III-IAI (dIsAmls)

Some Q are R.

All Q are P.

11 Therefore, some P are R.

$(\exists x)(Qx \wedge Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge R$	$Q > P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-EAO (fElAptOn)

All Q are not R.

All Q are P.

12 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q = \sim R$	$Q > P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-AEO (cAmEstrOs)

All R are Q.

All P are not Q.

23 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > \sim Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R = Q$	$P = \sim Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

IV-AEO (cAmEnOs)

All R are Q.

All Q are not P.

24 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R = Q$	$Q = \sim P$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

I-AAA (bArBArA)

All Q are R.

All P are Q.

1 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	3	3	3	V	V	V
	P	Q	R	$Q > R$	$P > Q$	$P > R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-EAE (cElArEnt)

All Q are not R.

All P are Q.

2 Therefore, all P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	3	3	3	V	V	V
	P	Q	R	$Q > \sim R$	$P > Q$	$P > R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-AII (dArII)

All Q are R.

Some P are Q.

3 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	3	3	3	V	3	3
	P	Q	R	$Q > R$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EIO (fErIO)

All Q are not R.

Some P are Q.

4 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	3	3
	P	Q	R	$Q > \sim R$	$P \wedge Q$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EAE (cEsArE)

All R are not Q.

All P are Q.

5 Therefore, all P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	3	3	3	V	V	V
	P	Q	R	$R > \sim Q$	$P > Q$	$P > R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-OAO (bOcArdO)

Some Q are not R.

All Q are P.

13 Therefore, some P are not R.

$(\exists x)(Qx \wedge \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	3	3
	P	Q	R	$Q \wedge \sim R$	$Q > P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	1	0
4	1	0	0	0	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-EIO (fErIsOn)

All Q are not R.

Some Q are P.

14 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	3	3
	P	Q	R	$Q > \sim R$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

IV-AAI (brAmAntip)

All R are Q.

All Q are P.

15 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	3	3	3	V	V	3
	P	Q	R	$R \wedge Q$	$Q > P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

IV-AEI (dImArIs)

Some R are Q.

All Q are P.

16 Therefore, some P are R.

$(\exists x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	3	3	3	V	V	V
	P	Q	R	$R > Q$	$Q > P$	$P > \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AEE (cAmEstrEs)

All R are Q.

All P are not Q.

6 Therefore, all P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Px > Qx)$ $(\exists x)(Px > \neg Rx)$

	3	3	3	V	V	V
P	Q	R	$R > Q$	$P > \neg Q$	$P > \neg R$	
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AOO (bArOcO)

All R are Q.

Some P are not Q.

7 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	3	3
P	Q	R	$R > Q$	$P \wedge \neg Q$	$P \wedge \neg R$	
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-EIO (fEstInO)

All R are not Q.

Some P are Q.

8 Therefore, some P are not R.

 $(\forall x)(Rx > Qx)$ $(\exists x)(Px \wedge \neg Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	3	3
P	Q	R	$R > \neg Q$	$P \wedge Q$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AAI (dArApTl)

All Q are R.

All Q are P.

9 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge Rx)$

	3	3	3	V	V	3
P	Q	R	$Q > R$	$Q > P$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AII (dAtsl)

All Q are R.

Some Q are P.

10 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Qx \wedge Px)$ $(\exists x)(Px \wedge Rx)$

	3	3	3	V	3	3
P	Q	R	$Q > R$	$Q \wedge P$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

IV-EAO (fEsApO)

All R are not Q.

All Q are P.

18 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Qx > Px)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	V	3
P	Q	R	$R > \neg Q$	$Q > P$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

IV-EIO (frEsIsOn)

All R are not Q.

Some Q are P.

19 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Qx \wedge Px)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	3	3
P	Q	R	$R > \neg Q$	$Q \wedge P$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AAI (bArBArI)

All Q are R.

All P are Q.

20 Therefore, some P are R.

 $(\forall x)(Qx > Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge Rx)$

	3	3	3	V	V	3
P	Q	R	$Q > R$	$P > Q$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EAO (cElArOnt)

All Q are not R.

All P are Q.

21 Therefore, some P are not R.

 $(\forall x)(Qx > \neg Rx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	V	3
P	Q	R	$Q > \neg R$	$P > Q$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-EAO (cEsArO)

All R are not Q.

All P are Q.

22 Therefore, some P are not R.

 $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

	3	3	3	V	V	3
P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow Q$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-IAI (dIsAmls)

Some Q are R.

All Q are P.

11 Therefore, some P are R.

$(\exists x)(Qx \wedge Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	3	3	3	3	V	3
P	Q	R	$Q \wedge R$	$Q > P$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-EAO (fElAptOn)

All Q are not R.

All Q are P.

12 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	V	3
P	Q	R	$Q > \sim R$	$Q > P$	$P \wedge \sim R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-AEO (cAmEstrOs)

All R are Q.

All P are not Q.

23 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > \sim Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	V	3
P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \sim Q$	$P \wedge \sim R$	
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

IV-AEO (cAmEnOs)

All R are Q.

All Q are not P.

24 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge \sim Rx)$

	3	3	3	V	V	3
P	Q	R	$R > Q$	$Q > P$	$P \wedge \sim R$	
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

FigI

I-AAA (bArBArA)

All Q are R.

All P are Q.

1 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-EAA

All Q are not R.

All P are Q.

17 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	0
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-AAI (bArBArI)

All Q are R.

All P are Q.

2 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EAI

All Q are not R.

All P are Q.

18 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	0	1	0
3	1	0	1	1	1	0
4	1	0	0	0	1	0
5	0	1	1	0	0	1
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AAE (cElArEnt)

All Q are R.

All P are Q.

3 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow Q$	$P \Rightarrow \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EAO (cElArOnt)

All Q are not R.

All P are Q.

19 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	0	1	0
5	0	1	1	0	1	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AIA

All Q are R.

Some P are Q.

5 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

I-EIA

All Q are not R.

Some P are Q.

21 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	1	1
3	1	0	1	1	1	0
4	1	0	0	0	1	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	1

FigI

I-AII (dArII)

All Q are R.

Some P are Q.

6 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EII

All Q are not R.

Some P are Q.

22 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	0	0
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-AIE

All Q are R.

Some P are Q.

7 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \Rightarrow \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	1
8	0	0	0	1	0	1

I-EIE

All Q are not R.

Some P are Q.

23 Therefore, all P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge Q$	$P \Rightarrow \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	0	1	0
7	0	0	1	1	0	1
8	0	0	0	1	0	1

I-AIO

All Q are R.

Some P are Q.

8 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \wedge Q$	$P \wedge \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EIO (fErIO)

All Q are not R.

Some P are Q.

24 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px > Qx)$

$(\exists x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	0	1	0
7	0	0	1	1	1	1
8	0	0	0	1	0	0

I-AEA

All Q are R.

All P are not Q.

9 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > \sim Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow \sim Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-EAA

All Q are not R.

All P are not Q.

25 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow \sim Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-AEI

All Q are R.

All P are not Q.

10 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Px > \sim Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow \sim Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-EEI

All Q are not R.

All P are not Q.

26 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Px > \sim Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow \sim R$	$P \Rightarrow \sim Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	1	0
7	0	0	1	1	1	0

FigI

I-AEE

All Q are R.
All P are not Q.

11 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-EEE

All Q are not R.
All P are not Q.

27 Therefore, all P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow \neg R$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

I-AEO

All Q are R.
All P are not Q.

12 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \Rightarrow \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EEO

All Q are not R.
All P are not Q.

28 Therefore, some P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$P \Rightarrow \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

I-AOA

All Q are R.
Some P are not Q.

13 Therefore, all P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$P \wedge \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	1

I-EOA

All Q are not R.
Some P are not Q.

29 Therefore, all P are R.

$(\forall x)(Qx > \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \neg R$	$P \wedge \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	0

I-AOI

All Q are R.
Some P are not Q.

14 Therefore, some P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$P \wedge \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EOI

All Q are not R.
Some P are not Q.

30 Therefore, some P are R.

$(\forall x)(Qx > \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$P \wedge \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-AOE

All Q are R.
Some P are not Q.

15 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$P \wedge \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	1

I-EOE

All Q are not R.
Some P are not Q.

31 Therefore, all P are not R.

$(\forall x)(Qx > \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \neg R$	$P \wedge \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

FigI

I-AOO

All Q are R.

Some P are not Q.

16 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$P \wedge \sim Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-EOO

All Q are not R.

Some P are not Q.

32 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$P \wedge \sim Q$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

FigI

I-IIA

Some Q are R.

All P are Q.

33 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$Q \wedge R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

I-IAI

Some Q are R.

All P are Q.

34 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

I-IAE

Some Q are R.

All P are Q.

35 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$Q \wedge R$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

I-IAO

Some Q are R.

All P are Q.

36 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge R$	$P \Rightarrow Q$	$P \wedge \neg R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

I-IIA

Some Q are R.

Some P are Q.

37 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	
	P	Q	R	$Q \wedge R$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

I-OAA

Some Q are not R.

All P are Q.

49 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$Q \wedge \neg R$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

I-OAI

Some Q are not R.

All P are Q.

50 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge \neg R$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	0	0	1
8	0	0	0	0	1	0

I-OAE

Some Q are not R.

All P are Q.

51 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$Q \wedge \neg R$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	0	1
8	0	0	0	0	0	0

I-OAO

Some Q are not R.

Some P are Q.

53 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	
	P	Q	R	$Q \wedge \neg R$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	0

FigI

I-III

Some Q are R.
Some P are Q.

38 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge R$	$P \wedge Q$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

I-OII

Some Q are not R.
Some P are Q.

54 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge \neg R$	$P \wedge Q$	$P \wedge R$	
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

I-II

Some Q are R.
Some P are Q.

39 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ
P	Q	R	$Q \wedge R$	$P \wedge Q$	$P \Rightarrow \neg R$	
1	1	1	1	1	0	
2	1	1	0	0	1	
3	1	0	1	0	0	
4	1	0	0	0	1	
5	0	1	1	0	0	
6	0	1	0	0	1	
7	0	0	1	0	1	
8	0	0	0	0	1	

I-OIE

Some Q are not R.
Some P are Q.

55 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$P \wedge Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	1
8	0	0	0	0	0	1

I-IIIO

Some Q are R.
Some P are Q.

40 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge R$	$P \wedge Q$	$P \wedge \neg R$	
1	1	1	1	1	0	
2	1	1	0	0	1	
3	1	0	1	0	0	
4	1	0	0	0	1	
5	0	1	1	0	0	
6	0	1	0	0	0	
7	0	0	1	0	0	
8	0	0	0	0	0	

I-OIO

Some Q are not R.
Some P are Q.

56 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge \neg R$	$P \wedge Q$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

I-IEA

Some Q are R.
All P are not Q.

41 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge R$	$P \Rightarrow \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	1	
2	1	1	0	0	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	1	1	
6	0	1	0	0	1	
7	0	0	1	1	1	
8	0	0	0	1	1	

I-OEA

Some Q are not R.
All P are not Q.

57 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$P \Rightarrow \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

I-IEI

Some Q are R.
All P are not Q.

42 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ	Ǝ
P	Q	R	$Q \wedge R$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	1	0	
2	1	1	0	0	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	1	0	
6	0	1	0	0	1	
7	0	0	1	1	1	
8	0	0	0	1	1	

I-OEI

Some Q are not R.
All P are not Q.

58 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ	Ǝ
P	Q	R	$Q \wedge \neg R$	$P \Rightarrow \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

FigI

I-HEE

Some Q are R.
All P are not Q.

43 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
P	Q	R	$Q \wedge R$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	
2	1	1	0	0	1	
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	1	1	
6	0	1	0	1	1	
7	0	0	1	1	1	
8	0	0	0	1	1	

I-IEO

Some Q are R.
All P are not Q.

44 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
P	Q	R	$Q \wedge R$	$P \Rightarrow \neg Q$	$P \wedge \neg R$	
1	1	1	1	0	0	
2	1	1	0	0	1	
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	1	0	
6	0	1	0	0	1	
7	0	0	1	1	0	
8	0	0	0	1	0	

I-HOA

Some Q are R.
Some P are not Q.

45 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
P	Q	R	$Q \wedge R$	$P \wedge \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	1	
2	1	1	0	0	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	0	1	
6	0	1	0	0	1	
7	0	0	1	0	1	
8	0	0	0	1	1	

I-IOI

Some Q are R.
Some P are not Q.

46 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge R$	$P \wedge \neg Q$	$P \wedge R$	
1	1	1	1	0	1	
2	1	1	0	0	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	0	0	
6	0	1	0	0	0	
7	0	0	1	0	0	
8	0	0	0	1	0	

I-IOE

Some Q are R.
Some P are not Q.

47 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
P	Q	R	$Q \wedge R$	$P \wedge \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	
2	1	1	0	0	1	
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	0	1	
6	0	1	0	0	1	
7	0	0	1	0	1	
8	0	0	0	1	1	

I-OEE

Some Q are not R.

All P are not Q.

59 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
P	Q	R	$Q \wedge \neg R$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	1
8	0	0	0	0	1	1

I-OEO

Some Q are not R.

All P are not Q.

60 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
P	Q	R	$Q \wedge \neg R$	$P \Rightarrow \neg Q$	$P \wedge \neg R$	
1	1	1	1	0	0	0
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	0

I-OOA

Some Q are not R.

Some P are not Q.

61 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
P	Q	R	$Q \wedge \neg R$	$P \wedge \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

I-OOI

Some Q are not R.

Some P are not Q.

62 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge \neg R$	$P \wedge \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

FigI

I-OOO

Some Q are R.

Some P are not Q.

48 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\exists	\exists	\exists
	P	Q	R	$Q \wedge R$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

I-OOO

Some Q are not R.

Some P are not Q.

64 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\exists	\exists	\exists
	P	Q	R	$Q \wedge \neg R$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

FigII

II-AAA

All R are Q.

All P are Q.

1 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AAI

All R are Q.

All P are Q.

2 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	1	0	0
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

II-AAE

All R are Q.

All P are Q.

3 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow Q$	$P \Rightarrow \sim R$
1	1	1	1	1	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	1	0	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AAO

All R are Q.

All P are Q.

4 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow Q$	$P \wedge \sim R$
1	1	1	1	1	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	1	0	1
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

II-AIA

All R are Q.

Some P are Q.

5 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$R \Rightarrow Q$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	1	0	0
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	1	0	1

II-EAA

All R are not Q.

All P are Q.

17 Therefore, all P are R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow \sim Q$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

II-EAI

All R are not Q.

All P are Q.

18 Therefore, some P are R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \sim Q$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

II-EAO

All R are not Q.

All P are Q.

20 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Px > Qx)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \sim Q$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	1

II-EIA

All R are not Q.

Some P are Q.

21 Therefore, all P are R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$R \Rightarrow \sim Q$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	1

FigII

II-AII

All R are Q.
Some P are Q.

6 Therefore, some P are R.

$(\forall x)(Rx > Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow Q$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-AIE

All R are Q.
Some P are Q.

7 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$R \Rightarrow Q$	$P \wedge Q$	$P \Rightarrow \neg R$
1	1	1	1	1	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	1	0	1

II-AIO

All R are Q.
Some P are Q.

8 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow Q$	$P \wedge Q$	$P \wedge \neg R$
1	1	1	1	1	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-AEA

All R are Q.
All P are not Q.

9 Therefore, all P are R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	0
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AEI

All R are Q.
All P are not Q.

10 Therefore, some P are R.

$(\forall x)(Rx > Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

II-EII

All R are not Q.

Some P are Q.

22 Therefore, some P are R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EIE

All R are not Q.

Some P are Q.

23 Therefore, all P are not R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	1
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EEA

All R are not Q.

All P are not Q.

25 Therefore, all P are R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

II-EEI

All R are not Q.

All P are not Q.

26 Therefore, some P are R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

FigII

II-AEE (cAmEstrEs)

All R are Q.

All P are not Q.

11 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > \neg Qx)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	1	1	1

II-AEO (cAmEstrOs)

All R are Q.

All P are not Q.

12 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Px > \neg Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$R \Rightarrow Q$	$P \Rightarrow \neg Q$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	1	1	0

II-AOA

All R are Q.

Some P are not Q.

13 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow Q$	$P \wedge \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	1	0	1

II-AOI

All R are Q.

Some P are not Q.

14 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$P \wedge \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0	0	0
8	0	0	0	1	0	0

II-AOE

All R are Q.

Some P are not Q.

15 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow Q$	$P \wedge \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	0	0	1
8	0	0	0	1	0	1

II-EEE

All R are not Q.

All P are not Q.

27 Therefore, all P are not R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	1	0
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

II-EEO

All R are not Q.

All P are not Q.

28 Therefore, some P are not R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px > \neg Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$R \Rightarrow \neg Q$	$P \Rightarrow \neg Q$	$P \wedge \neg R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	0
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	1

II-EOA

All R are not Q.

Some P are not Q.

29 Therefore, all P are R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge \neg Q$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EOI

All R are not Q.

Some P are not Q.

30 Therefore, some P are R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge \neg Q$	$P \wedge R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

II-EOE

All R are not Q.

Some P are not Q.

31 Therefore, all P are not R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow \neg Q$	$P \wedge \neg Q$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	0	1
7	0	0	1			

FigII

II-AOO (bArOcO)

All R are Q.

Some P are not Q.

16 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\forall	\exists	\exists
P	Q	R	$R \Rightarrow Q$	$P \wedge \sim Q$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	0	1
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	0	0
8	0	0	0	1	0

II-EOO

All R are not Q.

Some P are not Q.

32 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\forall	\exists	\exists
P	Q	R	$R \Rightarrow \sim Q$	$P \wedge \sim Q$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	1	1
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	1	0
8	0	0	0	1	0

FigII

II-IIA

Some R are Q.

All P are Q.

33 Therefore, all P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\forall x)(Px > Rx)$

\exists	\exists	\exists	\exists	\forall	\forall
P	Q	R	$R \wedge Q$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	1	1
2	1	1	0	0	0
3	1	0	1	0	0
4	1	0	0	0	0
5	0	1	1	1	1
6	0	1	0	0	1
7	0	0	1	0	1
8	0	0	0	1	1

II-IAI

Some R are Q.

All P are Q.

34 Therefore, some P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge Rx)$

\exists	\exists	\exists	\exists	\forall	\exists
P	Q	R	$R \wedge Q$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	1	1
2	1	1	0	0	0
3	1	0	1	0	0
4	1	0	0	0	0
5	0	1	1	1	0
6	0	1	0	0	0
7	0	0	1	0	0
8	0	0	0	1	0

II-IAE

Some R are Q.

All P are Q.

35 Therefore, all P are not R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\forall x)(Px > \neg Rx)$

\exists	\exists	\exists	\exists	\forall	\forall
P	Q	R	$R \wedge Q$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	1	0
2	1	1	0	0	1
3	1	0	1	0	0
4	1	0	0	0	1
5	0	1	1	1	1
6	0	1	0	0	1
7	0	0	1	0	1
8	0	0	0	1	1

II-IAO

Some R are Q.

All P are Q.

36 Therefore, some P are not R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\forall	\exists
P	Q	R	$R \wedge Q$	$P \Rightarrow Q$	$P \wedge \neg R$
1	1	1	1	1	0
2	1	1	0	0	1
3	1	0	1	0	0
4	1	0	0	0	1
5	0	1	1	1	0
6	0	1	0	0	0
7	0	0	1	0	0
8	0	0	0	1	0

II-IIA

Some R are Q.

Some P are Q.

37 Therefore, all P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\exists x)(Px \wedge Qx)$ $(\forall x)(Px > Rx)$

\exists	\exists	\exists	\exists	\forall	
P	Q	R	$R \wedge Q$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	1	1
2	1	1	0	0	0
3	1	0	1	0	1
4	1	0	0	0	0
5	0	1	1	1	1
6	0	1	0	0	1
7	0	0	1	0	1
8	0	0	0	0	1

II-OAA

Some R are not Q.

All P are Q.

49 Therefore, all P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\forall x)(Px > Rx)$

\exists	\exists	\exists	\exists	\forall	\forall
P	Q	R	$R \wedge \neg Q$	$P \Rightarrow Q$	$P \Rightarrow R$
1	1	1	1	0	1
2	1	1	0	0	1
3	1	0	1	1	0
4	1	0	0	0	0
5	0	1	1	0	1
6	0	1	0	0	1
7	0	0	1	1	1
8	0	0	0	0	1

II-OAI

Some R are not Q.

All P are Q.

50 Therefore, some P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge Rx)$

\exists	\exists	\exists	\exists	\forall	\exists
P	Q	R	$R \wedge \neg Q$	$P \Rightarrow Q$	$P \wedge R$
1	1	1	1	0	1
2	1	1	0	0	1
3	1	0	1	1	0
4	1	0	0	0	0
5	0	1	1	0	1
6	0	1	0	0	1
7	0	0	1	1	0
8	0	0	0	0	0

II-OAE

Some R are not Q.

All P are Q.

51 Therefore, all P are not R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\forall x)(Px > \neg Rx)$

\exists	\exists	\exists	\exists	\forall	\forall
P	Q	R	$R \wedge \neg Q$	$P \Rightarrow Q$	$P \Rightarrow \neg R$
1	1	1	1	0	1
2	1	1	0	0	1
3	1	0	1	1	0
4	1	0	0	0	1
5	0	1	1	0	1
6	0	1	0	0	1
7	0	0	1	1	1
8	0	0	0	0	1

II-OAO

Some R are not Q.

Some P are Q.

52 Therefore, some P are not R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\forall x)(Px > Qx)$ $(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\forall	\exists
P	Q	R	$R \wedge \neg Q$	$P \wedge Q$	$P \Rightarrow R$
1	1	1	1	0	1
2	1	1	0	0	1
3	1	0	1	1	0
4	1	0	0	0	0
5	0	1	1	0	1
6	0	1	0	0	0
7	0	0	1	1	0
8	0	0	0	0	1

II-OIA

Some R are not Q.

Some P are Q.

53 Therefore, all P are R.

 $(\exists x)(Rx \wedge \neg Qx)$ $(\exists x)(Px \wedge Qx)$ $(\forall x)(Px > Rx)$

FigII

II-III

Some R are Q.
Some P are Q.

38 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\exists	\exists
	P	Q	R	$R \wedge Q$	$P \wedge Q$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

II-IIIE

Some R are Q.
Some P are Q.

39 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\exists	\exists	\forall
	P	Q	R	$R \wedge Q$	$P \wedge Q$	$P \Rightarrow \neg R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

II-IIIO

Some R are Q.
Some P are Q.

40 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	\exists	\exists	\exists	\exists	\exists	\exists
	P	Q	R	$R \wedge Q$	$P \wedge Q$	$P \wedge \neg R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

II-IEA

Some R are Q.
All P are not Q.

41 Therefore, all P are R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	
	P	Q	R	$R \wedge Q$	$P \Rightarrow \neg Q$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

II-IEI

Some R are Q.
All P are not Q.

42 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	
	P	Q	R	$R \wedge Q$	$P \Rightarrow \neg Q$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

II-OII

Some R are not Q.

Some P are Q.

54 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\exists	\exists
	P	Q	R	$R \wedge \neg Q$	$P \wedge Q$	$P \wedge R$
1	1	1	1	0	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	0	0	0

II-OIE

Some R are not Q.

Some P are Q.

55 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\forall x)(Px > \neg Rx)$

	\exists	\exists	\exists	\exists	\forall	
	P	Q	R	$R \wedge \neg Q$	$P \wedge Q$	$P \Rightarrow \neg R$
1	1	1	1	0	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	0	0	1
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	0	0	0

II-OIO

Some R are not Q.

All P are not Q.

57 Therefore, all P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	
	P	Q	R	$R \wedge \neg Q$	$P \Rightarrow \neg Q$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	0	0	1
5	0	1	1	0	1	1
6	0	1	0	0	0	1
7	0	0	1	1	1	1
8	0	0	0	0	1	1

II-OEI

Some R are not Q.

All P are not Q.

58 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	
	P	Q	R	$R \wedge \neg Q$	$P \Rightarrow \neg Q$	$P \wedge R$
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	0	1	0

FigII

II-IEE

Some R are Q.
All P are not Q.

43 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
P	Q	R	$R \wedge Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	
2	1	1	0	1	0	1
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	1	1	
6	0	1	0	1	1	
7	0	0	1	1	1	
8	0	0	0	1	1	

II-IEO

Some R are Q.
All P are not Q.

44 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\forall x)(Px > \neg Qx)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
P	Q	R	$R \wedge Q$	$P \Rightarrow \neg Q$	$P \wedge \neg R$	
1	1	1	1	0	0	
2	1	1	0	1	0	1
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	1	0	
6	0	1	0	1	0	
7	0	0	1	1	0	
8	0	0	0	1	0	

II-IOA

Some R are Q.
Some P are not Q.

45 Therefore, all P are R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
P	Q	R	$R \wedge Q$	$P \wedge \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	1	
2	1	1	0	1	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	0	1	
6	0	1	0	1	1	
7	0	0	1	0	1	
8	0	0	0	1	1	

II-IOI

Some R are Q.
Some P are not Q.

46 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge Q$	$P \wedge \neg Q$	$P \wedge R$	
1	1	1	1	0	1	
2	1	1	0	1	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	0	0	
6	0	1	0	1	0	
7	0	0	1	0	0	
8	0	0	0	1	0	

II-IOE

Some R are Q.
Some P are not Q.

47 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$
 $(\exists x)(Px \wedge \neg Qx)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
P	Q	R	$R \wedge Q$	$P \wedge \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	
2	1	1	0	1	0	1
3	1	0	1	1	0	
4	1	0	0	1	1	
5	0	1	1	0	1	
6	0	1	0	1	0	
7	0	0	1	0	1	
8	0	0	0	1	1	

II-OEE

Some R are not Q.

All P are not Q.

59 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
P	Q	R	$R \wedge \neg Q$	$P \Rightarrow \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	1
8	0	0	0	0	1	1

II-OEO

Some R are not Q.

All P are not Q.

60 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Px > \neg Qx)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
P	Q	R	$R \wedge \neg Q$	$P \Rightarrow \neg Q$	$P \wedge \neg R$	
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	0	0	0

II-OOA

Some R are not Q.

Some P are not Q.

61 Therefore, all P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge \neg Q$	$P \wedge \neg Q$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	0	1	0
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	0	0	0

II-OOI

Some R are not Q.

Some P are not Q.

62 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge \neg Qx)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge \neg Q$	$P \wedge \neg Q$	$P \Rightarrow \neg R$	
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	0	0	1

FigII

II-OO

Some R are Q.

Some P are not Q.

48 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$R \wedge Q$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	1	0
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	0	0
8	0	0	0	1	0

II-OOO

Some R are not Q.

Some P are not Q.

64 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Px \wedge Qx)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$R \wedge \neg Q$	$P \wedge \neg Q$	$P \wedge \neg R$
1	1	1	1	0	0
2	1	1	0	0	0
3	1	0	1	1	1
4	1	0	0	0	1
5	0	1	1	0	0
6	0	1	0	0	0
7	0	0	1	1	0
8	0	0	0	0	0

FigIII

III-AAA

All Q are R.
All Q are P.

1 Therefore, all P are R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \Rightarrow R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-AAI (dArAPtI)

All Q are R.
All Q are P.

2 Therefore, some P are R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AAE

All Q are R.

All Q are P.

3 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > Px)$
 $(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \Rightarrow \sim R$	
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-AAO

All Q are R.

All Q are P.

4 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow P$	$P \wedge \sim R$	
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AIA

All Q are R.

Some Q are P.

5 Therefore, all P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \Rightarrow R$	
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	1	1

III-EAA

All Q are not R.

All Q are P.

17 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow P$	$P \Rightarrow R$	
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	1
6	0	1	0	0	0	0
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-EAI

All Q are not R.

All Q are P.

18 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow P$	$P \wedge R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-EAE

All Q are not R.

All Q are P.

19 Therefore, all P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow P$	$P \Rightarrow \sim R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-EIA

All Q are not R.

Some Q are P.

21 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
P	Q	R	$Q \Rightarrow \sim R$	$Q \wedge P$	$P \Rightarrow R$	
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

FigIII

III-AII (dAtIsI)

All Q are R.

Some Q are P.

6 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	0	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AIE

All Q are R.

Some Q are P.

7 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P = \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-AIO

All Q are R.

Some Q are P.

8 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AEA

All Q are R.

All Q are not P.

9 Therefore, all P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow \sim P$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-AEI

All Q are R.

All Q are not P.

10 Therefore, some P are R.

$(\forall x)(Qx > Rx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow \sim P$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-EII

All Q are not R.

Some Q are P.

22 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$Q \wedge P$	$P \wedge R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	1	0	0
4	1	0	0	1	0	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-EIE

All Q are not R.

Some Q are P.

23 Therefore, all P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\forall
	P	Q	R	$Q \Rightarrow \sim R$	$Q \wedge P$	$P \Rightarrow \sim R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	1	0	0
4	1	0	0	1	0	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-EEA

All Q are not R.

All Q are not P.

25 Therefore, all P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\forall	\forall	\forall
	P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow \sim P$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	1	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-EEI

All Q are not R.

All Q are not P.

26 Therefore, some P are R.

$(\forall x)(Qx > \sim Rx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\forall	\forall	\exists
	P	Q	R	$Q \Rightarrow \sim R$	$Q \Rightarrow \sim P$	$P \wedge R$
1	1	1	1	0	0	1
2	1	1	0	1	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

FigIII

III-AEE

All Q are R.
All Q are not P.

11 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > \neg Px)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-AEO

All Q are R.
All Q are not P.

12 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$
 $(\forall x)(Qx > \neg Px)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow R$	$Q \Rightarrow \neg P$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-AOA

All Q are R.
Some Q are not P.

13 Therefore, all P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Qx \wedge \neg Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-AOI

All Q are R.
Some Q are not P.

14 Therefore, some P are R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Qx \wedge \neg Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow R$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-AOE

All Q are R.
Some Q are not P.

15 Therefore, all P are not R.

$(\forall x)(Qx > Rx)$
 $(\exists x)(Qx \wedge \neg Px)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow R$	$Q \wedge \neg P$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-EEE

All Q are not R.

All Q are not P.

27 Therefore, all P are not R.

$(\forall x)(Qx > \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	∀
	P	Q	R	$Q \Rightarrow \neg R$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-EEO

All Q are not R.

All Q are not P.

28 Therefore, some P are not R.

$(\forall x)(Qx > \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	∀	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$Q \Rightarrow \neg P$	$P \wedge \neg R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-EOA

All Q are not R.

Some Q are not P.

29 Therefore, all P are R.

$(\forall x)(Qx > \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \neg R$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0	0	0
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-EOI

All Q are not R.

Some Q are not P.

30 Therefore, some P are R.

$(\forall x)(Qx > \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$Q \Rightarrow \neg R$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-EOE

All Q are not R.

Some Q are not P.

31 Therefore, all P are not R.

$(\forall x)(Qx > \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$Q \Rightarrow \neg R$	$Q \wedge \neg P$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	0	0

FigIII

III-AOO (bArOcO)

All Q are R.

Some Q are not P.

16 Therefore, some P are not R.

$(\forall x)(Qx > Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\forall	\exists	\exists
P	Q	R	$Q \Rightarrow R$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	0	1
3	1	0	1	1	0
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	0	0
7	0	0	1	0	0
8	0	0	0	1	0

III-EOO

All Q are not R.

Some Q are not P.

32 Therefore, some P are not R.

$(\forall x)(Qx > \sim Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\forall	\exists	\exists
P	Q	R	$Q \Rightarrow \sim R$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	1	1
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	1	0
8	0	0	0	1	0

FigIII

III-IIA

Some Q are R.
All Q are P.

33 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
	P	Q	R	$Q \wedge R$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

III-OAA

Some Q are not R.

All Q are P.

49 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	0	1
6	0	1	0	0	0	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

III-IAI

Some Q are R.

All Q are P.

34 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-OAI

Some Q are not R.

All Q are P.

50 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	1	0
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-IAE

Some Q are R.

All Q are P.

35 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge R$	$Q \Rightarrow P$	$P \Rightarrow \neg R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	1	0	1
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

Some Q are not R.

All Q are P.

51 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow P$	$P \Rightarrow \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	1
4	1	0	0	0	1	1
5	0	1	1	0	0	1
6	0	1	0	1	0	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

III-OAO

(bOcArdO)

Some Q are not R.

All Q are P.

52 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > Px)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow P$	$P \wedge \neg R$
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	1
4	1	0	0	0	1	1
5	0	1	1	0	0	0
6	0	1	0	1	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-OIA

Some Q are not R.

Some Q are P.

53 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	
	P	Q	R	$Q \wedge \neg R$	$Q \wedge P$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	1
6	0	1	0	1	1	1
7	0	0	1	0	0	0
8	0	0	0	0	0	1

FigIII

III-III

Some Q are R.
Some Q are P.

38 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge R$	$Q \wedge P$	$P \wedge R$	
1	1	1	1	1	1	1
2	1	1	0	0	0	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

III-II

Some Q are R.
Some Q are P.

39 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ
P	Q	R	$Q \wedge R$	$Q \wedge P$	$P \Rightarrow \neg R$	
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	1
6	0	1	0	0	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

III-II

Some Q are R.
Some Q are P.

40 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\exists x)(Qx \wedge Px)$
 $(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge R$	$Q \wedge P$	$P \wedge \neg R$	
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

III-IEA

Some Q are R.
All Q are not P.

41 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > \neg Px)$
 $(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge R$	$Q \Rightarrow \neg P$	$P \Rightarrow R$	
1	1	1	1	0	1	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	0	0
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-IEI

Some Q are R.
All Q are not P.

42 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$
 $(\forall x)(Qx > \neg Px)$
 $(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ǝ
P	Q	R	$Q \wedge R$	$Q \Rightarrow \neg P$	$P \wedge R$	
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-OII

Some Q are not R.

Some Q are P.

54 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$Q \wedge \neg R$	$Q \wedge P$	$P \wedge R$	
1	1	1	1	0	1	1
2	1	1	0	1	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

III-OIE

Some Q are not R.

Some Q are P.

55 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$Q \wedge P$	$P \Rightarrow \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	1	1
3	1	0	1	0	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

III-OIO

Some Q are not R.

All Q are not P.

56 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$Q \wedge P$	$P \wedge \neg R$	
1	1	1	1	0	1	0
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	0	1
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	0	1	1
8	0	0	0	0	0	1

III-OEA

Some Q are not R.

All Q are not P.

57 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow \neg P$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-OEI

Some Q are not R.

All Q are not P.

58 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow \neg P$	$P \wedge R$	
1	1	1	1	0	0	1
2	1	1	0	1	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

FigIII

III-IEE

Some Q are R.

All Q are not P.

43 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
	P	Q	R	$Q \wedge R$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

III-IEO

Some Q are R.

All Q are not P.

44 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	Ǝ
	P	Q	R	$Q \wedge R$	$Q \Rightarrow \neg P$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	1	0

III-IOA

Some Q are R.

Some Q are not P.

45 Therefore, all P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
	P	Q	R	$Q \wedge R$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-IOI

Some Q are R.

Some Q are not P.

46 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$Q \wedge R$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

III-IOE

Some Q are R.

Some Q are not P.

47 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	∀
	P	Q	R	$Q \wedge R$	$Q \wedge \neg P$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

III-OEE

Some Q are not R.

All Q are not P.

59 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	∀	∀
	P	Q	R	$Q \wedge \neg R$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	1	0	1
3	1	0	1	0	1	0
4	1	0	0	0	0	1
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

III-OEO

Some Q are not R.

All Q are not P.

60 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\forall x)(Qx > \neg Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	1
6	0	1	0	1	1	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

III-OOI

Some Q are not R.

Some Q are not P.

62 Therefore, some P are R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$Q \wedge \neg R$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	0	0	1
2	1	1	0	1	0	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	1	1	0
7	0	0	1	0	0	0
8	0	0	0	0	0	0

III-OOE

Some Q are not R.

Some Q are not P.

63 Therefore, all P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > \neg Rx)$

FigIII

III-100

Some Q are R.

Some Q are not P.

48 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$Q \wedge R$	$Q \wedge \neg P$	$P \wedge \neg R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	1	0
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	0	0
8	0	0	0	1	0

III-000

Some Q are not R.

Some Q are not P.

64 Therefore, some P are not R.

$(\exists x)(Qx \wedge \neg Rx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$Q \wedge \neg R$	$Q \wedge \neg P$	$P \wedge \neg R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	0	0
4	1	0	0	0	1
5	0	1	1	0	1
6	0	1	0	1	1
7	0	0	1	0	0
8	0	0	0	0	0

FigIV

IV-AAA

All R are Q.

All Q are P.

1 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > Rx)$

\exists	\exists	\exists	\forall	\forall	\forall
P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	1	1
2	1	1	0	1	1
3	1	0	1	0*	1
4	1	0	0	1	1
5	0	1	1	0*	1
6	0	1	0	1	0*
7	0	0	1	0*	1
8	0	0	0	1	1
			1	1	0

IV-AAI

All R are Q.

All Q are P.

2 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

\exists	\exists	\exists	\forall	\forall	\exists
P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1*
2	1	1	0	1	0
3	1	0	1	0*	1
4	1	0	0	1	0
5	0	1	1	0*	0
6	0	1	0	1	0*
7	0	0	1	0*	1
8	0	0	0	1	0

IV-AAE

All R are Q.

All Q are P.

3 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > \neg Rx)$

\exists	\exists	\exists	\forall	\forall	\forall
P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \Rightarrow \neg R$
1	1	1	1	1	0
2	1	1	0	1	1
3	1	0	1	0*	1
4	1	0	0	1	1
5	0	1	1	0*	1
6	0	1	0	1	0*
7	0	0	1	0*	1
8	0	0	0	1	1

IV-AAO

All R are Q.

All Q are P.

4 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\forall	\forall	\exists
P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \wedge \neg R$
1	1	1	1	1	0
2	1	1	0	1	1*
3	1	0	1	0*	1
4	1	0	0	1	1
5	0	1	1	0*	0
6	0	1	0	1	0*
7	0	0	1	0*	0
8	0	0	0	1	0

IV-AIA

All R are Q.

Some Q are P.

5 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > Rx)$

\exists	\exists	\exists	\forall	\exists	\forall
P	Q	R	$R \Rightarrow Q$	$Q \wedge P$	$P \Rightarrow R$
1	1	1	1	1	1*
2	1	1	0	1	1*
3	1	0	1	0*	0
4	1	0	0	1	0
5	0	1	1	0	1
6	0	1	0	1	0
7	0	0	1	0*	1
8	0	0	0	1	1

IV-EAA

All R are not Q.

All Q are P.

17 Therefore, all P are R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > Rx)$

\exists	\exists	\exists	\forall	\forall	\forall
P	Q	R	$R \Rightarrow \neg Q$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	0*	1
2	1	1	0	1	1
3	1	0	1	1	1
4	1	0	0	1	0
5	0	1	1	0*	0
6	0	1	0	1	0
7	0	0	1	1	1
8	0	0	0	1	1

IV-EAI

All R are not Q.

All Q are P.

18 Therefore, some P are R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

\exists	\exists	\exists	\forall	\forall	\exists
P	Q	R	$R \Rightarrow \neg Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	0*	1
2	1	1	0	1	1
3	1	0	1	1	1
4	1	0	0	1	1
5	0	1	1	0*	0
6	0	1	0	1	0
7	0	0	1	1	1
8	0	0	0	1	1

IV-EAO

All R are not Q.

All Q are P.

20 Therefore, some P are not R.

$(\forall x)(Rx > \neg Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \neg Rx)$

\exists	\exists	\exists	\forall	\forall	\exists
P	Q	R	$R \Rightarrow \neg Q$	$Q \wedge P$	$P \Rightarrow R$
1	1	1	1	0*	1
2	1	1	0	1	1
3	1	0	1	1	0
4	1	0	0	1	0
5	0	1	1	0*	0
6	0	1	0	1	0
7	0	0	1	1	0
8	0	0	0	1	1

IV-EIA

All R are not Q.

Some Q are P.

21 Therefore, all P are R.

$(\forall x)(Rx > \neg Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > Rx)$

FigIV

IV-AII

All R are Q.

Some Q are P.

6 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$Q \wedge P$	$P \wedge R$
1	1	1	1	1	1*	1
2	1	1	0	1	1*	0
3	1	0	1	0*	0	1
4	1	0	0	1	0	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0*	0	0
8	0	0	0	1	0	0

IV-EII

All R are not Q.

Some Q are P.

22 Therefore, some P are R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$Q \wedge P$	$P \wedge R$
1	1	1	1	0*	1	1
2	1	1	0	1	1	0
3	1	0	1	1	0	1
4	1	0	0	1	0	0
5	0	1	1	0*	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

IV-AIE

All R are Q.

Some Q are P.

7 Therefore, all P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow Q$	$Q \wedge P$	$P \Rightarrow \sim R$
1	1	1	1	1	1*	0
2	1	1	0	1	1*	1
3	1	0	1	0*	0	0
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5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	0*	0	1
8	0	0	0	1	0	1

IV-EIE

All R are not Q.

Some Q are P.

23 Therefore, all P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow \sim Q$	$Q \wedge P$	$P \Rightarrow \sim R$
1	1	1	1	0*	1	0
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5	0	1	1	0*	0	1
6	0	1	0	1	0	0
7	0	0	1	1	0	1
8	0	0	0	1	0	1

IV-AIO

All R are Q.

Some Q are P.

8 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	1	1*	0
2	1	1	0	1	1*	1
3	1	0	1	0*	0	0
4	1	0	0	1	0	1
5	0	1	1	1	1	1
6	0	1	0	1	0	0
7	0	0	1	0*	0	0
8	0	0	0	1	0	0

IV-EIO

(frEsIsOn)

All R are not Q.

Some Q are P.

24 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Px > Qx)$

$(\exists x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$Q \wedge P$	$P \wedge \sim R$
1	1	1	1	0*	1	0
2	1	1	0	1	1	1
3	1	0	1	1	1	0
4	1	0	0	1	0	1
5	0	1	1	0*	0	0
6	0	1	0	1	1	0
7	0	0	1	1	1	0
8	0	0	0	1	0	0

IV-AEA

All R are Q.

All Q are not P.

9 Therefore, all P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow \sim P$	$P \Rightarrow R$
1	1	1	1	1	0*	1
2	1	1	0	1	0*	0
3	1	0	1	0*	1	1
4	1	0	0	1	1	0
5	0	1	1	1	1	1
6	0	1	0	1	1	0
7	0	0	1	0*	1	1
8	0	0	0	1	1	1

IV-EAA

All R are not Q.

All Q are not P.

25 Therefore, all P are R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀
	P	Q	R	$R \Rightarrow \sim Q$	$Q \Rightarrow \sim P$	$P \Rightarrow R$
1	1	1	1	0*	0	1
2	1	1	0	1	1	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	0*	0	0
6	0	1	0	1	1	0
7	0	0	1	1	1	1
8	0	0	0	1	1	1

IV-AEI

All R are Q.

All Q are P.

10 Therefore, some P are R.

$(\forall x)(Rx > Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	0*	1
2	1	1	0	1	0*	0
3	1	0	1	0*	1	1
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5	0	1	1	1	1	0
6	0	1	0	1	1	0
7	0	0	1	0*	1	0
8	0	0	0	1	1	0

IV-EI

All R are not Q.

All Q are P.

26 Therefore, some P are R.

$(\forall x)(Rx > \sim Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	∀	Ǝ	Ǝ
	P	Q	R	$R \Rightarrow \sim Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	0*	0	1
2	1	1	0	1	1	0
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4	1	0	0	1	1	0
5	0	1	1	0*	0	0
6	0	1	0	1	1	0
7	0	0	1			

FigIV

IV-AEO All R are Q. <u>All Q are not P.</u> 12 Therefore, some P are not R. $(\forall x)(Rx > Qx)$ $(\forall x)(Qx > \neg Px)$ $(\exists x)(Px \wedge \neg Rx)$	<table border="1" style="border-collapse: collapse; width: 100%; border: none;"> <thead> <tr> <th></th> <th>Ǝ</th> <th>Ǝ</th> <th>Ǝ</th> <th>∀</th> <th>∀</th> <th>Ǝ</th> </tr> <tr> <th>P</th> <th>Q</th> <th>R</th> <th>$R \Rightarrow Q$</th> <th>$Q \Rightarrow \neg P$</th> <th>$P \wedge \neg R$</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0*</td><td>0</td></tr> <tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0*</td><td>1</td></tr> <tr><td>3</td><td>1</td><td>0</td><td>1</td><td>0*</td><td>1</td><td>0</td></tr> <tr><td>4</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>5</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>6</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>7</td><td>0</td><td>0</td><td>1</td><td>0*</td><td>1</td><td>0</td></tr> <tr><td>8</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr> </tbody> </table>		Ǝ	Ǝ	Ǝ	∀	∀	Ǝ	P	Q	R	$R \Rightarrow Q$	$Q \Rightarrow \neg P$	$P \wedge \neg R$		1	1	1	1	1	0*	0	2	1	1	0	1	0*	1	3	1	0	1	0*	1	0	4	1	0	0	1	1	1	5	0	1	1	1	0	0	6	0	1	0	1	0	0	7	0	0	1	0*	1	0	8	0	0	0	1	1	0	IV-EEO All R are not Q. <u>All Q are not P.</u> 28 Therefore, some P are not R. $(\forall x)(Rx > \neg Qx)$ $(\forall x)(Qx > \neg Px)$ $(\exists x)(Px \wedge \neg Rx)$	<table border="1" style="border-collapse: collapse; width: 100%; border: none;"> <thead> <tr> <th></th> <th>Ǝ</th> <th>Ǝ</th> <th>Ǝ</th> <th>∀</th> <th>∀</th> <th>Ǝ</th> </tr> <tr> <th>P</th> <th>Q</th> <th>R</th> <th>$R \Rightarrow \neg Q$</th> <th>$Q \Rightarrow \neg P$</th> <th>$P \wedge \neg R$</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0*</td><td>0</td><td>0</td></tr> <tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>3</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>4</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>5</td><td>0</td><td>1</td><td>1</td><td>0*</td><td>0</td><td>0</td></tr> <tr><td>6</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>7</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>8</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr> </tbody> </table>		Ǝ	Ǝ	Ǝ	∀	∀	Ǝ	P	Q	R	$R \Rightarrow \neg Q$	$Q \Rightarrow \neg P$	$P \wedge \neg R$		1	1	1	1	0*	0	0	2	1	1	0	1	1	1	3	1	0	1	1	1	0	4	1	0	0	1	1	1	5	0	1	1	0*	0	0	6	0	1	0	1	1	0	7	0	0	1	1	1	0	8	0	0	0	1	1	0
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IV-AOE All R are Q. <u>Some Q are not P.</u> 15 Therefore, all P are not R. $(\forall x)(Rx > Qx)$ $(\exists x)(Qx \wedge \neg Px)$ $(\forall x)(Px > Rx)$	<table border="1" style="border-collapse: collapse; width: 100%; border: none;"> <thead> <tr> <th></th> <th>Ǝ</th> <th>Ǝ</th> <th>Ǝ</th> <th>∀</th> <th>Ǝ</th> <th>∀</th> </tr> <tr> <th>P</th> <th>Q</th> <th>R</th> <th>$R \Rightarrow Q$</th> <th>$Q \wedge \neg P$</th> <th>$P \Rightarrow \neg R$</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>3</td><td>1</td><td>0</td><td>1</td><td>0*</td><td>0</td><td>0</td></tr> <tr><td>4</td><td>1</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>5</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1*</td><td>1</td></tr> <tr><td>6</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1*</td><td>1</td></tr> <tr><td>7</td><td>0</td><td>0</td><td>1</td><td>0*</td><td>0</td><td>1</td></tr> <tr><td>8</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> </tbody> </table>		Ǝ	Ǝ	Ǝ	∀	Ǝ	∀	P	Q	R	$R \Rightarrow Q$	$Q \wedge \neg P$	$P \Rightarrow \neg R$		1	1	1	1	1	0	0	2	1	1	0	1	0	1	3	1	0	1	0*	0	0	4	1	0	0	1	0	1	5	0	1	1	1	1*	1	6	0	1	0	1	1*	1	7	0	0	1	0*	0	1	8	0	0	0	1	0	1	IV-EOE All R are not Q. <u>Some Q are not P.</u> 31 Therefore, all P are not R. $(\forall x)(Rx > \neg Qx)$ $(\exists x)(Qx \wedge \neg Px)$ $(\forall x)(Px > Rx)$	<table border="1" style="border-collapse: collapse; width: 100%; border: none;"> <thead> <tr> <th></th> <th>Ǝ</th> <th>Ǝ</th> <th>Ǝ</th> <th>∀</th> <th>Ǝ</th> <th>∀</th> </tr> <tr> <th>P</th> <th>Q</th> <th>R</th> <th>$R \Rightarrow \neg Q$</th> <th>$Q \wedge \neg P$</th> <th>$P \Rightarrow \neg R$</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0*</td><td>0</td><td>0</td></tr> <tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>3</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>4</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>5</td><td>0</td><td>1</td><td>1</td><td>0*</td><td>0</td><td>1</td></tr> <tr><td>6</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>7</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>8</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> </tbody> </table>		Ǝ	Ǝ	Ǝ	∀	Ǝ	∀	P	Q	R	$R \Rightarrow \neg Q$	$Q \wedge \neg P$	$P \Rightarrow \neg R$		1	1	1	1	0*	0	0	2	1	1	0	1	0	1	3	1	0	1	1	1	0	4	1	0	0	1	1	1	5	0	1	1	0*	0	1	6	0	1	0	1	0	1	7	0	0	1	1	0	0	8	0	0	0	1	0	0
	Ǝ	Ǝ	Ǝ	∀	Ǝ	∀																																																																																																																																									
P	Q	R	$R \Rightarrow Q$	$Q \wedge \neg P$	$P \Rightarrow \neg R$																																																																																																																																										
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4	1	0	0	1	0	1																																																																																																																																									
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7	0	0	1	1	0	0																																																																																																																																									
8	0	0	0	1	0	0																																																																																																																																									

FigIV

IV-AOO

All R are Q.

Some Q are not P.

16 Therefore, some P are not R.

$(\forall x)(Rx > Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow Q$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	0*	0	0
4	1	0	0	1	0	1
5	0	1	1	1	1*	0
6	0	1	0	1	1*	0
7	0	0	1	0*	0	0
8	0	0	0	1	0	0

IV-EOO

All R are not Q.

Some Q are not P.

32 Therefore, some P are not R.

$(\forall x)(Rx > \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\forall	\exists	\exists
	P	Q	R	$R \Rightarrow \sim Q$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	0*	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	0*	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

FigIV

IV-IIA

Some R are Q.

All Q are P.

33 Therefore, all P are R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$R \wedge Q$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	1	1
4	1	0	0	0	1	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	0	1	1
8	0	0	0	0	1	1

IV-OAA

Some R are not Q.

All Q are P.

49 Therefore, all P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$R \wedge \sim Q$	$Q \Rightarrow P$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	0	1	0
3	1	0	1	1	1	1
4	1	0	0	0	0	1
5	0	1	1	0	0	1
6	0	1	0	0	0	1
7	0	0	1	1	1	1
8	0	0	0	0	1	1

IV-IAI

(dimArIs)

Some R are Q.

All Q are P.

34 Therefore, some P are R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$R \wedge Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	1	1	1*
2	1	1	0	0	1	0
3	1	0	1	0	1	1*
4	1	0	0	0	1	0
5	0	1	1	1	0*	0
6	0	1	0	0	0*	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

IV-OAI

Some R are not Q.

All Q are P.

50 Therefore, some P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge Rx)$

	\exists	\exists	\exists	\exists	\forall	\exists
	P	Q	R	$R \wedge \sim Q$	$Q \Rightarrow P$	$P \wedge R$
1	1	1	1	0	1	1*
2	1	1	0	0	1	0
3	1	0	1	1	1	1*
4	1	0	0	0	0	0
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	0	1	0

IV-IAE

Some R are Q.

All Q are P.

35 Therefore, all P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > Px)$

$(\forall x)(Px > \sim Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$R \wedge Q$	$Q \Rightarrow P$	$P \Rightarrow \sim R$
1	1	1	1	1	1	0
2	1	1	0	0	1	1
3	1	0	1	0	1	0
4	1	0	0	0	1	1
5	0	1	1	1	0	0
6	0	1	0	0	0	0
7	0	0	1	0	1	0
8	0	0	0	0	1	0

IV-OAE

Some R are not Q.

All Q are P.

51 Therefore, all P are not R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\forall x)(Qx > Px)$

$(\exists x)(Px \wedge \sim Rx)$

	\exists	\exists	\exists	\exists	\forall	\forall
	P	Q	R	$R \wedge \sim Q$	$Q \Rightarrow P$	$P \Rightarrow \sim R$
1	1	1	1	0	1	0
2	1	1	0	0	1	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	0	0
6	0	1	0	0	0	0
7	0	0	1	1	1	1
8	0	0	0	0	1	0

IV-IIA

Some R are Q.

Some Q are P.

37 Therefore, all P are R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	
	P	Q	R	$R \wedge Q$	$Q \wedge P$	$P \Rightarrow R$
1	1	1	1	1	1	1
2	1	1	0	0	1	0
3	1	0	1	0	0	1
4	1	0	0	0	0	0
5	0	1	1	1	0	1
6	0	1	0	0	0	1
7	0	0	1	0	0	1
8	0	0	0	0	0	1

IV-OAO

Some R are not Q.

Some Q are P.

53 Therefore, all P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > Rx)$

	\exists	\exists	\exists	\exists	\forall	
	P	Q	R	$R \wedge \sim Q$	$Q \wedge P$	$P \Rightarrow R$
1	1	1	1	0	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	1
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	0	0	1

FigIV

IV-III

Some R are Q.

Some Q are P.

38 Therefore, some P are R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge Q$	$Q \wedge P$	$P \wedge R$	
1	1	1	1	1	1	
2	1	1	0	0	0	
3	1	0	1	0	0	1
4	1	0	0	0	0	
5	0	1	1	0	0	
6	0	1	0	0	0	
7	0	0	1	0	0	
8	0	0	0	0	0	

IV-OII

Some R are not Q.

Some Q are P.

54 Therefore, some P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge \sim Q$	$Q \wedge P$	$P \wedge R$	
1	1	1	1	0	1	1
2	1	1	0	0	1	0
3	1	0	1	1	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	0	0	1
7	0	0	1	1	0	0
8	0	0	0	0	0	0

IV-IIIE

Some R are Q.

Some Q are P.

39 Therefore, all P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ
P	Q	R	$R \wedge Q$	$Q \wedge P$	$P \Rightarrow \sim R$	
1	1	1	1	1	0	
2	1	1	0	0	1	
3	1	0	1	0	0	
4	1	0	0	0	1	
5	0	1	1	0	0	
6	0	1	0	0	0	
7	0	0	1	0	1	
8	0	0	0	0	1	

IV-OIE

Some R are not Q.

Some Q are P.

55 Therefore, all P are not R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\forall x)(Px > \sim Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ
P	Q	R	$R \wedge \sim Q$	$Q \wedge P$	$P \Rightarrow \sim R$	
1	1	1	1	0	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	0
6	0	1	0	0	0	1
7	0	0	1	1	0	1
8	0	0	0	0	0	1

IV-IIIO

Some R are Q.

Some Q are P.

40 Therefore, some P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge Q$	$Q \wedge P$	$P \wedge \sim R$	
1	1	1	1	1	0	
2	1	1	0	0	1	
3	1	0	1	0	0	
4	1	0	0	0	1	
5	0	1	1	1	0	
6	0	1	0	0	0	
7	0	0	1	0	0	
8	0	0	0	0	0	

IV-OIO

Some R are not Q.

Some Q are P.

56 Therefore, some P are not R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge \sim Q$	$Q \wedge P$	$P \wedge \sim R$	
1	1	1	1	0	1	0
2	1	1	0	0	1	1
3	1	0	1	1	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	0
6	0	1	0	0	0	1
7	0	0	1	1	1	0
8	0	0	0	0	0	0

IV-IEA

Some R are Q.

All Q are not P.

41 Therefore, all P are R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ
P	Q	R	$R \wedge Q$	$Q \Rightarrow \sim P$	$P \Rightarrow R$	
1	1	1	1	0	1	
2	1	1	0	1	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	1	1	
6	0	1	0	1	1	
7	0	0	1	1	1	
8	0	0	0	1	1	

IV-OEA

Some R are not Q.

All Q are not P.

57 Therefore, all P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\forall x)(Qx > \sim Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ⱶ	Ⱶ	Ⱶ
P	Q	R	$R \wedge \sim Q$	$Q \Rightarrow \sim P$	$P \Rightarrow R$	
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	0	0	1
5	0	1	1	0	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	0	1	1

IV-IEI

Some R are Q.

All Q are not P.

42 Therefore, some P are R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge Q$	$Q \Rightarrow \sim P$	$P \wedge R$	
1	1	1	1	0	1	
2	1	1	0	1	0	
3	1	0	1	1	1	
4	1	0	0	1	0	
5	0	1	1	1	0	
6	0	1	0	1	0	
7	0	0	1	1	0	
8	0	0	0	1	0	

IV-OEI

Some R are not Q.

All Q are not P.

58 Therefore, some P are R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\forall x)(Qx > \sim Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
P	Q	R	$R \wedge \sim Q$	$Q \Rightarrow \sim P$	$P \wedge R$	
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	1	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	0	0	0
7	0	0	1	1	1	0
8	0	0	0	0	1	0

FigIV

IV-IEE

Some R are Q.

All Q are not P.

43 Therefore, all P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ	Ⓐ
	P	Q	R	$R \wedge Q$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	1	1
6	0	1	0	1	1	1
7	0	0	1	1	1	1
8	0	0	0	1	1	1

IV-OEE

Some R are not Q.

All Q are not P.

59 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Qx > \neg Px)$

$(\forall x)(Px > \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ	Ⓐ
	P	Q	R	$R \wedge \neg Q$	$Q \Rightarrow \neg P$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	1	1
6	0	1	0	0	1	1
7	0	0	1	1	1	1
8	0	0	0	0	1	1

IV-IEO

Some R are Q.

All Q are not P.

44 Therefore, some P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\forall x)(Qx > \neg Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ	Ǝ
	P	Q	R	$R \wedge Q$	$Q \Rightarrow \neg P$	$P \wedge \neg R$
1	1	1	1	1	0	0
2	1	1	0	1	0	1
3	1	0	1	1	1	0
4	1	0	0	1	1	1
5	0	1	1	1	0	0
6	0	1	0	1	0	1
7	0	0	1	1	0	0
8	0	0	0	1	1	0

IV-OEO

Some R are not Q.

All Q are not P.

60 Therefore, some P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\forall x)(Qx > \neg Px)$

$(\exists x)(Px \wedge \neg Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ	Ǝ
	P	Q	R	$R \wedge \neg Q$	$Q \Rightarrow \neg P$	$P \wedge \neg R$
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	1	0
4	1	0	0	0	1	1
5	0	1	1	0	1	0
6	0	1	0	0	1	0
7	0	0	1	1	1	0
8	0	0	0	0	1	0

IV-IOA

Some R are Q.

Some Q are not P.

45 Therefore, all P are R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ
	P	Q	R	$R \wedge Q$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	1
6	0	1	0	1	0	1
7	0	0	1	1	0	1
8	0	0	0	1	0	1

IV-OOA

Some R are not Q.

Some Q are not P.

61 Therefore, all P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ
	P	Q	R	$R \wedge \neg Q$	$Q \wedge \neg P$	$P \Rightarrow R$
1	1	1	1	0	0	1
2	1	1	0	0	0	0
3	1	0	1	1	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	1
6	0	1	0	0	1	1
7	0	0	1	1	0	1
8	0	0	0	0	0	1

IV-IOI

Some R are Q.

Some Q are not P.

46 Therefore, some P are R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$R \wedge Q$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	1	0	1
2	1	1	0	1	0	0
3	1	0	1	1	1	1
4	1	0	0	1	1	0
5	0	1	1	1	0	0
6	0	1	0	1	0	0
7	0	0	1	1	0	0
8	0	0	0	1	0	0

IV-OOI

Some R are not Q.

Some Q are not P.

62 Therefore, some P are R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\exists x)(Px \wedge Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ
	P	Q	R	$R \wedge \neg Q$	$Q \wedge \neg P$	$P \wedge R$
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	0	1
4	1	0	0	0	0	0
5	0	1	1	0	1	0
6	0	1	0	0	1	0
7	0	0	1	1	0	0
8	0	0	0	0	0	0

IV-OOE

Some R are not Q.

Some Q are not P.

63 Therefore, all P are not R.

$(\exists x)(Rx \wedge \neg Qx)$

$(\exists x)(Qx \wedge \neg Px)$

$(\forall x)(Px > Rx)$

	Ǝ	Ǝ	Ǝ	Ǝ	Ǝ	Ⓐ
	P	Q	R	$R \wedge \neg Q$	$Q \wedge \neg P$	$P \Rightarrow \neg R$
1	1	1	1	0	0	0
2	1	1	0	0	0	1
3	1	0	1	1	0	0
4	1	0	0	0	0	1
5	0	1	1	0	1	1
6	0	1	0	0	1	1
7	0	0	1	1	0	1
8	0	0	0	0	0	1

FigIV

IV-100

Some R are Q.

Some Q are not P.

48 Therefore, some P are not R.

$(\exists x)(Rx \wedge Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$R \wedge Q$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	1	0
3	1	0	1	1	0
4	1	0	0	1	1
5	0	1	1	0	0
6	0	1	0	1	0
7	0	0	1	0	0
8	0	0	0	1	0
					0

IV-000

Some R are not Q.

Some Q are not P.

64 Therefore, some P are not R.

$(\exists x)(Rx \wedge \sim Qx)$

$(\exists x)(Qx \wedge Px)$

$(\exists x)(Px \wedge \sim Rx)$

\exists	\exists	\exists	\exists	\exists	\exists
P	Q	R	$R \wedge \sim Q$	$Q \wedge \sim P$	$P \wedge \sim R$
1	1	1	1	0	0
2	1	1	0	0	0
3	1	0	1	1	0
4	1	0	0	0	1
5	0	1	1	0	1
6	0	1	0	0	1
7	0	0	1	1	0
8	0	0	0	0	0