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PHIL 12

Professor Agler

November 07, 2020

Exercise Set #1

A)

1.

1	$(\exists x)Px$	P
2	$(\forall x)\neg Px$	P
3	Pa	1∃D
4	$\neg Pa$	2∀D
	X	

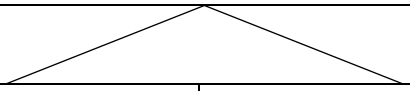
2.

1	$\neg (\forall x)Px$	P
2	Pb	P
3	$(\exists x) \neg Px$	1¬∀D
4	$\neg Pa$	1∃D
	X	

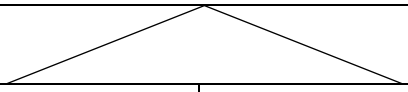
3.

1	$(\exists x)(Px \wedge Qx)$		P
2	$(\forall x)Px \rightarrow (\forall x)Qx$		P
3	$Pa \wedge Qa$		1∃D
4	Pa		3∧D
5	Qa		3∧D
6	$\neg (\forall x)Px$	$(\forall x)Qx$	2→D
7	$(\exists x) \neg Px$		6¬∀D
	$\neg Pb$		7∃D
	O	Qa	6∀D
		O	

4.

1	¬ (∀x)Px		P
2	¬ (∀y)(Py∧Gy)		P
3	(∀z)(Pz∧¬ Gz)		P
4	(∃x) ¬ Px		1¬∀D
5	¬ Pa		4∃D
6	Pb∧¬ Gb		2∀D
7	Pb		6∧D
8	¬ Gb		6∧D
9	(∃y) ¬ (Py∧Gy)		2¬∀D
10	¬ (Pc∧Gc)		9∃D
			
11	¬ Pc	¬ Gc	10¬∧D
	O	**O**	

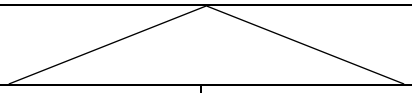
5.

1	¬ (∀x)(Px∧Qx)		P
2	(∃y) (Py∧Qy)		P
3	Pa∧Qa		2∃D
4	Pa		3∧D
5	Qa		3∧D
6	(∃x)¬(Px∧Qx)		2¬∀D
7	¬(Pb∧Qb)		6∃D
			
8	¬Pb	¬Qb	7¬∧D
	O	**O**	

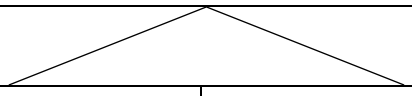
Exercise Set #2

A)

1. Consistent

1	$(\exists x)\,(Px \rightarrow Qx)$		P
2	$(\exists x)\,(Px)$		P
3	Pa		2∃D
4	$Pb \rightarrow Qb$		
			
5	$\neg Pb$	Qb	4→D
	O	**O**	

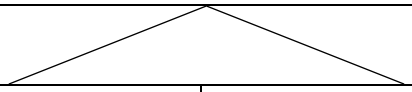
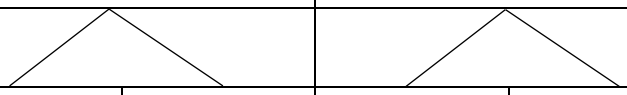
2. Consistent

1	$(\exists x)\,(Px \rightarrow Rx)$		P
2	$\neg Pa$		P
3	$\neg Pb$		P
4	$Pc \rightarrow Rc$		1∃D
			
5	$\neg Pc$	Rc	
	O	**O**	

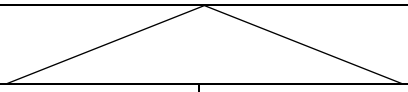
3.

1	$(\forall x)\, Px \vee (\exists y) Qy$		P
2	$(\exists x)(Px \wedge Qa)$		P
3	$Pb \wedge Qa$		$2\exists D$
4	Pb		$3\wedge D$
5	Qa		$3\wedge D$
6	$(\forall x)\, Px$	$(\exists y) Qy$	$1\vee D$
	Pa		$6\forall D$
	Pb		$6\forall D$
		Qc	$6\exists D$
	O	**O**	

4. Consistent

1	$(\exists x)\ (Px \vee Qx)$				P
2	$\neg\ (\forall x)(Px \rightarrow \neg\ Qa)$				P
3	$(\exists x)\ \neg(Px \rightarrow \neg\ Qa)$				$2\neg\forall D$
4	$\neg(Pb \rightarrow \neg\ Qa)$				$3\exists D$
5	$Pc \vee Qc$				$1\exists D$
					
	Pa		Qa		$5\vee D$
					
	$\neg Pb$	$\neg\ Qa$	$\neg Pb$	$\neg\ Qa$	$5\rightarrow D$
	O	**O**	**O**	**X**	

5. Inconsistent

1	$(\forall x)(Px \rightarrow Mx)$		P
2	$(\exists x)(Px)$		P
3	$\neg (\exists x)(Mx)$		P
4	Pa		$2\exists D$
5	$(\forall x) \neg Mx$		$3\neg\exists D$
6	$\neg Ma$		$5\forall D$
7	$Pa \rightarrow Ma$		$1\forall D$
			
8	$\neg Pa$	Ma	$7\rightarrow D$
	X	**X**	