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PHIL 12

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Exercise Set #1

A)

1.

1	$Pa \rightarrow Qb$	P
2	Pa	P/$(\exists y)Qy$
3	Qb	1,2 $\rightarrow$E
4	$(\exists y)Qy$	3 $\exists$I

2.

1	Ma	P
2	$(\exists x)Mx \rightarrow (Ra \wedge Tb)$	P/$(\exists x)Rx$
3	$(\exists x)Mx$	1 $\exists$I
4	$(Ra \wedge Tb)$	2,3 $\rightarrow$E
5	Tb	4$\wedge$D
6	Ra	4$\wedge$D
7	$(\exists x)Rx$	6 $\exists$I

3.

1	$(\forall x)(Px \rightarrow Rx)$	P
2	$Pa \wedge Ma$	$P/(\exists z)Rz$
3	Ma	$2 \wedge D$
4	Pa	$2 \wedge D$
5	$Pa \rightarrow Ra$	$1 \forall E$
6	Ra	$4,5 \rightarrow E$
7	$(\exists z)Rz$	$6 \exists I$

4.

1	Pa	P
2	$[(\exists x)Px \wedge (\exists y)Py] \rightarrow Qt$	P/Qt
3	$(\exists x)Px$	$2 \exists I$
4	$(\exists y)Py$	$2 \exists I$
5	$(\exists x)Px \wedge (\exists y)Py$	$3,4 \wedge D$
6	Qt	$2,5 \rightarrow E$

5.

1	$(\forall x)(Px)$	P
2	$(\forall x)Px \rightarrow Gb$	$P/(\exists x)Gx$
3	Gb	$1,2 \rightarrow E$
4	$(\exists x)Gx$	$3\exists I$

Exercise Set #2

A)

1.

1	(∃x)(Gx)		P/(∃z)(Gz)
2		Ga	A
3		(∃z)(Gz)	2 ∃I
4	(∃z)(Gz)		1, 2-3 ∃E

2.

1	(∀x)(Fx∧Mx)	P/(∃z)Fz
2	Fa∧Ma	1∀E
3	Fa	2∧E
4	(∃z)Fz	3 ∃I

3.

1	$(\exists x)[Rx \wedge (\exists z)(Mz)]$			P/$(\exists y)(My)$
2		$Ra \wedge (\exists z)(Mz)$		A/$\exists$E
3			$(\exists z)(Mz)$	2$\wedge$E
4			Mb	3 $\exists$E
5			$(\exists y)(My)$	4 $\exists$I
6		$(\exists y)(My)$		3, 4-5 $\exists$E
7	$(\exists y)(My)$			1, 2-6 $\exists$E

4.

1	$(\forall x)(Zx \wedge Mx)$	P
2	$(\exists x)Zx \rightarrow Ra$	P/$(\exists y)Ry$
3	$Zb \wedge Mb$	1 $\forall$E
4	Zb	3$\wedge$E
5	$(\exists x)Zx$	4 $\exists$I
6	Ra	2,5 $\rightarrow$E
7	$(\exists y)Ry$	6 $\exists$I

5.

1	$(\forall x)(\forall y)(Zxa \wedge Mxy)$	$P/(\forall z)(Zza \wedge Mzz)$
2	$(\forall y)(Zba \wedge Mby)$	$1\forall E$
3	$Zba \wedge Mbb$	$2\forall E$
4	$(\forall z)(Zza \wedge Mzz)$	$3\forall I$