(b)

1	(1)	$\forall x(Fx \rightarrow Gx)$	A
2	(2)	Fa	A
1	(3)	$Fa \rightarrow Ga$	1 $\forall$E
1,2	(4)	Ga	2,3 $\rightarrow$E
1,2	(5)	Fa & Ga	2,5 &I
1,2	(6)	$\exists x(Fx \,\&\, Gx)$	5 $\exists$I

(c)

1	(1)	$\forall xFax$	A
1	(2)	$\exists y\, \forall xFyx$	1 $\exists$I

existential-elim Given a sentence (at line *m*) and an assumption (at line *i*) that is an instance of some existentially quantified sentence that is present (at line *k*), conclude the given sentence again.

Condition: The instantial name at line *i* must not appear in the sentence at line *k* or in the sentence at line *m*. Also, it must not appear in any of the assumptions belonging to the assumption set at line *m*, other than the instance *i* itself.

Annotation: ***k,m*** **$\exists$E(*i*)**

Assumption set: all assumptions at line *m* other than *i*, and *all* assumptions at line *k*.

Examples.

(a)

1	(1)	$\exists xFx$	A
2	(2)	Fa	A
2	(3)	$Fa \vee Ga$	2 $\vee$I
2	(4)	$\exists x(Fx \vee Gx)$	3 $\exists$I
1	(5)	$\exists x(Fx \vee Gx)$	1,4 $\exists$E(2)