Fitch-style Rules for First-Order Logic

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1.1 Universal Elimination (∀E)

1	$\forall x\, Px$	
2	Pa	∀E, 1

1	$\forall x(P(x) \land Q(x))$	
2	P(c) $\land Q(c)$	∀E, 1

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1.2 Existential Introduction (∃I)

1	Pa	
2	$\exists x\, Px$	∃I, 1

1	P(c) $\land Q(c)$	
2	$\exists x(P(x) \land Q(c))$	∃I, 1

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1.3 Universal Introduction (∀I)

1	Pa	
2	⋮	
3	Qa	
4	$\forall x\, Qx$	∀I, 1–3

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1.4 Existential Elimination (∃E)

1	$\exists x\, Px$	
2	Pa	
3	⋮	
4	Q	
5	Q	∃E, 1, 2–4

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1.5 Identity Introduction (=I)

1	a = a	=I

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1.6 Identity Elimination (=E)

1	a = b	
2	Pa	
3	Pb	=E, 1, 2