AN F.O.L. NATURAL-DEDUCTION EXAMPLE

Show $\neg\forall x[\alpha(x)] \vdash \exists x[\neg\alpha(x)]$:

1. $\neg\forall x[\alpha(x)]$ // assumption

/*
Show $\exists x[\neg\alpha(x)]$:
Show $\neg\alpha(t)$, for some t & use $\exists$-Intro:
/*

*2.	$\alpha(t)$	// temporary assumption (with arbitrary t)
*3.	$\forall x[\alpha(x)]$	// 2, $\forall$-Intro
*4.	$\neg\forall x[\alpha(x)]$	// send 1
*5.	$\neg\alpha(t)$	// 2,3,4, $\neg$-Intro
6.	$\neg\alpha(t)$	// return 5
7.	$\exists x[\neg\alpha(x)]$	// $\exists$-Intro

Exercise for the reader: Use $\forall$-Intro to show: $\neg\exists x[\alpha(x)] \vdash \forall x[\neg\alpha(x)]$

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