EXISTENTIAL ELIM (∃E) Given the following:

1. a sentence (at line *m*),
2. an existentially quantified sentence (at line *k*),

   and

3. an assumption (at line *i*) that is an instance of the sentence at line *k*,

conclude the sentence at line *m* again.

ASSUMPTION SET: all the assumptions on line *m* and *k*, **with the exception of** *i*.

RESTRICTION: the instantial name at line *i* does not occur in any of the following:

1. the sentence at line *m*,
2. the sentence at line *k*, or
3. any sentence in the assumption sets of lines *m* or *k* except for line *i*.

(R. Smith, http://aristotle.tamu.edu/~rasmith/Courses/Logic/Exercises/3.3.html)

Assume an instance of an existential sentence that we already have as a line of the proof

1. Draw further inferences from that assumption
2. Conclude a sentence that does not contain the instantial name of the assumption any more (often by using ∃I).
3. Add another line that contains the same sentence just concluded, but with the assumption set changed so that the number of the assumption we made is replaced with the assumption set of the existential sentence

(R. Smith, http://aristotle.tamu.edu/~rasmith/Courses/Logic/Exercises/3.3.html)

Existential Elimination

WHAT YOU NEED:

i. An existentially quantified sentence, i.e. $\exists xFx$

ii. An *assumed instance* of that sentence, i.e. Fa

iii. Some further sentence that no longer contains the name instantiated at (ii), i.e. $\exists x(Fx \vee Gx)$.

HOW TO DO IT:

a. Repeat the content of the line at (iii).
b. Cite the lines at (i and iii).

Discharge the assumption from (ii)

EXAMPLE:

$\exists xFx \vdash \exists x(Fx \vee Gx)$

1	**(1)**	**$\exists xFx$**		**A**	**i. [This is our given premise]**
2	**(2)**	**Fa**		**A**	**ii. [This is an assumption that we are introducing into the proof, and that we'll discharge at our last step]-step 1**
2	**(3)**	**$Fa \vee Ga$**		**2VI**	
2	**(4)**	**$\exists x(Fx \vee Gx)$**		**3∃I**	**iii.**
1	**(5)**	**$\exists x(Fx \vee Gx)$**	**1,4**	**∃E (2)**	***Repeat (iii), cite (i, iii), discharge (ii)***

NOTE: The instantial name at line (*i*)—in this case, the name "a", does not appear anywhere in our cited lines, nor does it appear anywhere in the assumption set for lines (*i*) or (*iii*), with the exception of line (*ii*).