

reductio ad absurdum Given both a sentence and its denial (at lines m and n), conclude the denial of any assumption appearing in the proof (at line k).

Annotation: m, n RAA (k)

Assumption set: The union of the assumption sets at m and n , excluding k (the denied assumption).

Comment: The sentence at line k is the assumption discharged (a.k.a. the **REDUCTIO ASSUMPTION**) and the conclusion must be a denial of the discharged assumption. The sentences at lines m and n must be denials of each other.

Also known as: Indirect Proof (IP), \sim Intro/ \sim Elim.

Examples.

(a)

1	(1)	$P \rightarrow Q$	A
2	(2)	$\sim Q$	A
3	(3)	P	A
1,3	(4)	Q	$1,3 \rightarrow E$
1,2	(5)	$\sim P$	$2,4$ RAA(3)

(b)

1	(1)	$P \vee Q$	A
2	(2)	$\sim P$	A
3	(3)	$\sim P \rightarrow \sim Q$	A
2,3	(4)	$\sim Q$	$2,3 \rightarrow E$
1,2,3	(5)	P	$1,4 \vee E$
1,3	(6)	P	$2,5$ RAA(2)

(c)

1	(1)	P	A
2	(2)	Q	A
3	(3)	$\sim Q$	A
2,3	(4)	$\sim P$	$2,3$ RAA(1)