

$LI\ T \neq \perp$ means that the term contains redex, which can be eta redex or beta redex

Rule 1 - In this case variable V does not contain any redex therefore it is undefined

1. $LI\ V = \perp$

Rule 2 - This case if T contains the redex then the left Innermost redex will be LI T

2. $LI\ \lambda\ V.T = LI\ T$; if $LI\ T \neq \perp$

Rule 3 - if T does not contain redex and the whole term is not eta redex then answer will be undefined \perp .

3. $LI\ \lambda\ V.T = \perp$; if $LI\ T = \perp$ $\&\& \text{is_etaRedex}(\lambda\ V.T) = \text{false}$

Rule 4 - when we have two terms T1 and T2, and term T1 has the redex so the leftmost innermost term becomes T1. therefore

4. $LI\ (T1\ T2) = LI\ T1$; if $LI\ T1 \neq \perp$

Rule 5 - when we have two terms T1 and T2 , term T1 has no redex and term T2 has redex. and overall (T1 T2) has no beta redex

5. $LI\ (T1\ T2) = LI\ T2$; if $LI\ T1 = \perp$ $\&\& LI\ T2 \neq \perp$ $\&\& \text{isbetaredex}(T1\ T2) = \text{False}$

Rule 6 -when we have two terms and both T1 and T2 dont have redex but we have beta redex on the overall term (T1 T2). so (T1 T2) becomes our leftmost innermost redex.

6. $LI\ (T1\ T2) = (T1\ T2)$; if $LI\ T1 = \perp$ $\&\& LI\ T2 = \perp$ $\&\& \text{isbetaredex}(T1\ T2) = \text{true}$

Rule 7 - when we have two terms and T1 and T2 both dont have redex and neither there is beta redex on (T1 T2). Then the answer is undefined.

7. $LI\ (T1\ T2) = \perp$; if $LI\ T1 = \perp$, if $LI\ T2 = \perp$ $\&\& \text{is_betaredex}(T1\ T2) = \text{false}$

Rule 8 - If Term T contains the redex then the leftmost innermost redex is T.

8. $LI\ \lambda\ V.(T\ V) = LI\ T$, if $LI\ T \neq \perp$

Rule 9. If Term T has no redex and but overall term is an eta redex

11. $LI\ \lambda\ V.T = \lambda\ V.T$; if $LI\ T = \perp$ $\&\& \text{is_etaRedex}(\lambda\ V.T) = \text{true}$