

Member 1: Shaghayegh Dehghanisani, shaghayegh.dehghanis@torontomu.ca, 501080180

Member 2: Theresa Killam, theresa.killam@torontomu.ca, 501101333

a. $[X, Y \mid Z]$ and $[a, b, c \mid [d, e, Y]]$

LHS: $[X, Y \mid Z]$

RHS: $[a, b, c \mid [d, e, Y]] = [a, b, c, d, e, Y]$

Therefore, this pair is identical as $X = a, Y = b, Z = [c, d, e, b] \Rightarrow$ match

b. $[q, [A \mid [r, s]], t]$ and $[q, [r, [r, s]] \mid B]$

LHS: $[q, [A \mid [r, s]], t] = [q, [A, r, s], t]$

RHS: $[q, [r, [r, s]] \mid B]$ already in simplest form

$q = q$

$[r, [r, s]] = [A, r, s] \Rightarrow A = r, [r, s] = [r, s]$

$B = t$

With all above Identical pair \Rightarrow match

c. $[[Cow \mid [cat, dog]], bird, bug, chicken]$ and $[[ant, [cat, dog]] \mid Horse]$

LHS: $[[Cow \mid [cat, dog]], bird, bug, chicken] = [[Cow, cat, dog], bird, bug, chicken]$

RHS: $[[ant, [cat, dog]] \mid Horse]$ already in simplest form

Left side has the list of $[Cow, cat, dog]$ where as right side has the nested list of $[cat, dog]$

\Rightarrow no match

d. $[1, A, 2 \mid [A, 3, 4]]$ and $[B \mid [2, C \mid [D \mid E]]]$

LHS: $[1, A, 2 \mid [A, 3, 4]] = [1, A, 2, A, 3, 4]$

RHS: $[B \mid [2, C \mid [D \mid E]]] = [B \mid [2, C, D \mid E]] = [B, 2, C, D \mid E]$

Identical pair with $A=2, B=1, C=2, D=2, E=[3,4] \Rightarrow$ match

e. $[A \mid [A \mid [[A \mid [[A]]]]]]$ and $[b \mid C]$

LHS: $[A \mid [A \mid [[A \mid [[A]]]]]] = [A \mid [A \mid [[A, [A]]]]] = [A \mid [A, [A, [A]]]]$

$= [A, A, [A, [A]]]$

RHS: $[b \mid C]$ simplest form

$A = b$ then left side is $[b, b, [b, [b]]]$ and $C = [b, [b, [b]]] \Rightarrow$ match

f. $[X \mid [Y \mid [Z \mid [X]]]]$ and [all, around, the, world, Y]

LHS: $[X \mid [Y \mid [Z \mid [X]]]] = [X \mid [Y \mid [Z, X]]] = [X \mid [Y, Z, X]] = [X, Y, Z, X]$

RHS: [all, around, the, world, Y] already in simplest form

Left side has 4 elements in the list whereas right side has 5 elements => no match

g. $[1, 2 \mid [X \mid [Y, Z \mid X]]]$ and $[Q \mid [R, S, [], [Y]]]$

LHS: $[1, 2 \mid [X \mid [Y, Z \mid X]]] = [1, 2 \mid [X, Y, Z \mid X]] = [1, 2, X, Y, Z \mid X]$

RHS: $[Q \mid [R, S, [], [Y]]] = [Q, R, S, [], [Y]]$

$Q = 1, R = 2, X = S, Y = [], Z = [Y] = [[]] \Rightarrow$ last element of left side needs to be empty too so $X = S = [] \Rightarrow$ match

h. [Lions, [[and], tigers], [and], bears, oh | [[my]]] and [[I, have] , [[A], Bad], Feeling | [About | This]]

LHS: [Lions, [[and], tigers], [and], bears, oh | [[my]]] =

[Lions, [[and], tigers], [and], bears, oh , [my]]

RHS: [[I, have], [[A], Bad], Feeling | [About | This]] =

[[I, have], [[A], Bad], Feeling , About | This]

Lions = [I , have]

[[and], tigers] = [[A], Bad] => A = and , Bad = tigers

[and] = Feeling

bears = About

[oh , [my]] = This

Identical pair => match