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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

$q = q, A = r, [r, s] = [r, s], B = t$

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  $[Cow, cat, dog]$  whereas 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:  $[B \mid [2, C \mid [D \mid E]]] = [B \mid [2, C, D \mid E]] = [B, 2, C, D, E]$

Left side has 6 elements in the list whereas right side has 5 elements  $\Rightarrow$  no 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