

thb[x_, y_][UU[L_], UU[R_]] :=

CF[UU[Expand[Distribute[pp[L, R]] /. {

pp[0, _] → 0, pp[_ , 0] → 0,

pp[_β | _δβ | _c | _ao | _ca | _aao,

_β | _δβ | _c | _ao | _ca | _aao] → 0,

pp[_a, _β | _δβ] → 0,

pp[β[f_], a[g_, i_, j_]] := Kδ_{yj} ao[g ∂_{b_x} f, i, y],

pp[a[f_, i_, j_], a[g_, k_, l_]] := Kδ_{yl} (

aao[g ∂_{b_x} f, k, l, i, j] + ca[g b_i ∂_{b_x} f, j, k, y] +

Kδ_{xi} (a[-g f b_k, x, j] + a[g f b_x, k, j] +

aao[-g ∂_{b_x} f, x, j, k, y] +

aao[g ∂_{b_x} f, k, j, x, y] + ao[-g b_x ∂_{b_x} f, k, j] +

ca[-g f, y, k, j] + ca[g f, j, k, y])),

pp[a[f_, i_, j_], c[g_, k_]] :=

Kδ_{ix} Kδ_{ky} ao[-f g, x, j],

pp[a[f_, i_, j_], ao[g_, k_, l_]] :=

Kδ_{xi} Kδ_{yl} ao[f g b_x, k, j],

pp[a[f_, i_, j_], ca[g_, k_, l_, m_]] := Kδ_{xi} (

Kδ_{yk} (aao[-f g, l, j, x, m] + ca[-f g b_l, m, x, j]) +

Kδ_{ym} (ca[-f g b_l, k, x, j] + ca[f g b_x, k, l, j]) -

Kδ_{y,k,m} ao[f g b_l, x, j]),

pp[a[f_, i_, j_], aao[g_, k_, l_, m_, n_]] := Kδ_{xi} (

Kδ_{yl} (aao[f g b_x, k, j, m, n] +

ca[f g b_k b_m, n, x, j]) +

Kδ_{yn} (aao[f g b_x, k, j, m, l] +

ca[f g b_k b_m, l, x, j]) +

Kδ_{y,l,n} ao[f g b_k b_m, x, j]),

pp[_δβ | _c, _a] → 0,

pp[ao[f_, i_, j_], a[g_, k_, l_]] :=

Kδ_{xi} Kδ_{yl} (-ao[b_k f g, i, j] + ao[b_i f g, k, j]),

pp[ca[f_, m_, i_, j_], a[g_, k_, l_]] :=

Kδ_{xi} Kδ_{yl} (ca[-f g b_k, m, x, j] + ca[f g b_x, m, k, j]),

pp[aao[f_, x, j_, x, n_], a[g_, k_, y]] :=

aao[-2 f g b_k, x, j, x, n] + aao[2 f g b_x, k, j, x, n],

pp[aao[f_, i_, j_, m_, n_], a[g_, k_, l_]] :=

Kδ_{xi} Kδ_{yl} (aao[-f g b_k, m, j, x, n] +

aao[f g b_x, k, j, m, n]) +

Kδ_{xm} Kδ_{yl} (aao[-f g b_k, i, j, x, n] +

aao[f g b_x, i, j, k, n]))];];

thb[x_, y_][L_UU, R_UU] := -thb[y, x][R, L];