

Pensieve header: $(123) = [(412), (253)] = [[(341), (152)], [(125), (543)]] = \dots$

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Decommute = p[j_, k_, m_] := Module[{i, l},
  {i, l} = Complement[Range[5], {j, k, m}];
  c[p[i, j, k], p[k, l, m]]
];
Format[p[i_, j_, k_]] := "(" <> ToString[i] <> ToString[j] <> ToString[k] <> ")";
Format[c[a_, b_]] := "[" <> ToString[a] <> ", " <> ToString[b] <> "]";

p[2, 3, 5] /. Decommute
[(123), (345)]

p[1, 2, 3] /. Decommute
[(412), (253)]

p[1, 2, 3] /. Decommute /. Decommute
[[ (341), (152) ], [ (125), (543) ]]

p[1, 2, 3] /. Decommute /. Decommute /. Decommute
[[ [ (234), (451) ], [ (315), (542) ] ], [ [ (312), (245) ], [ (154), (423) ] ] ]

p[1, 2, 3] /. Decommute /. Decommute /. Decommute /. Decommute
[[ [ [ (123), (354) ], [ (245), (531) ] ], [ [ (231), (145) ], [ (154), (432) ] ] ], [ [ (431), (152) ], [ (124), (435) ] ], [ [ (215), (534) ], [ (142), (253) ] ] ] ] ]
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