[CASE 6]

If all elements of $Z=\begin{pmatrix} p_1^2 & p_1 p_2 \\ p_1 p_2 & p_2^2 \end{pmatrix}$ AND $f_k=0$, $[m_0^2 \neq 0]$

then primary reduction formula ① becomes:

$$(*) \quad \frac{1}{2}\Big[\delta_{n_k 0} B_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_{\hat{k}}}}(\hat{D}_k) - B_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}(\hat{D}_0)\Big] = n_k C_{\hat{k}00\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}} + \text{vanishing } Z \,\&\, f \text{ terms.}$$

Use (**) of previous page for second eqn.

$$(d+2(n_1+n_2+r))\, C_{\underbrace{0\cdots0}_{2r+2}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}} = B_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}(\hat{D}_0) + m_0^2\, C_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}$$

solve for this.

use this if $r=-1$

$$(**) \quad C_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}} = \frac{1}{m_0^2}\Big[(d+2(n_1+n_2+r))\, C_{\underbrace{0\cdots0}_{2r+2}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}} - B_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}(\hat{D}_0)\Big]$$

To implement in Mathematica,

put $n_k \to n_k+1$ in $(*)$ put $r=0$ in $(**)$

$r \to r-1$

$$\underbrace{C_{\underbrace{0\cdots0}_{2r}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}}_{P} = \frac{1}{2(n_k+1)}\Big[\overbrace{\delta_{n_k+1,0}\, B(\hat{D}_k)}^{0} - B_{k\underbrace{0\cdots0}_{2r-2}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}(\hat{D}_0)\Big] \qquad r \geq 1$$

$$= \frac{-1}{2(n_k+1)}\, \underbrace{B_{k\underbrace{0\cdots0}_{2r-2}\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}}_{P-1}(\hat{D}_0)$$

AND

$$\underbrace{C_{\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}}_{P} = \frac{1}{m_0^2}\Big[(d+2(n_1+n_2))\, \underbrace{C_{00\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}}_{P+2} - \underbrace{B_{\underbrace{1\cdots1}_{n_1}\underbrace{2\cdots2}_{n_2}}}_{P}(\hat{D}_0)\Big] \qquad \text{when } r=0$$