

```

Zip1_{ } = Identity;

Zip1_{vs_} @ {  $\mathcal{F}_$ ,  $\mathbb{E}[Q_, P_{\_}]$  } := PP_{Zip1}@Module[{ $\mathcal{I}$ , F, G, u, v},
  (*Echo[{vs,  $\mathcal{F}$ , Q, P}];*)
   $\mathcal{I}$  = IdentityMatrix@Length@vs;
  F = Table[If[Wt[u] + Wt[v] == {1, 0},  $\partial_{F[u], F[v]} \mathcal{F}$ , 0], {u, vs}, {v, vs}];
  G = Table[If[Wt[u] + Wt[v] == {1, 0},  $\partial_{u, v} Q$ , 0], {u, vs}, {v, vs}];
  (*Echo@MatrixForm[ $\mathcal{I}$  - G.F];*)
  {CF[(F /@ vs) . (F.Inverse[ $\mathcal{I}$  - G.F]) . (F /@ vs) / 2],
     $\mathbb{E}$ [CF[Q - PowerExpand@Log[Det[ $\mathcal{I}$  - G.F]] / 2 - vs.G.vs / 2], P]}
]

```