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⊖ [K_] := Module [ {Cs, φ, n, A, Δ, G, ev, θ},
  {Cs, φ} = Rot [K]; n = Length [Cs];
  A = IdentityMatrix [2 n + 1];
  Cases [Cs, {s_, i_, j_} := (A[[{i, j}, {i + 1, j + 1}]] += (

$$\begin{pmatrix} -T^s & T^s & -1 \\ \theta & & -1 \end{pmatrix}$$

))] ];
  Δ = T(-Total [φ] - Total [Cs[[All, 1]]) / 2 Det [A];
  G = Inverse [A];
  ev [ε_] := Factor [ε /. gv, α, β := (G[[α, β]] /. T → Tv)];
  θ = ev [∑k=1n F1 [Cs[[k]]]];
  θ += ev [∑k1=1n ∑k2=1n F2 [Cs[[k1]], Cs[[k2]]]];

  θ += ev [∑k=12n F3 [φ[[k]], k]];
  Factor @ {Δ, (Δ /. T → T1) (Δ /. T → T2) (Δ /. T → T3) θ}];

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