```
R₁[s_, i_, j_] :=
  s (g_{ji} (g_{j+1,j} + g_{j,j+1} - g_{ij}) - g_{ii} (g_{j,j+1} - 1) - 1 / 2);
ρ[K_] := Module[{Cs, φ, n, A, s, i, j, k, Δ, G, ρ1},
    {Cs, φ} = Rot[K]; n = Length[Cs];
    A = IdentityMatrix[2 n + 1];
    Cases[Cs, {s_, i_, j_} ⧴
        (A[[{i, j}, {i + 1, j + 1}]] += ( -T^s  T^s - 1 ) )];
                                        (  0    -1   )
    Δ = T^((-Total[φ]-Total[Cs[[All,1]]])/2) Det[A];
    G = Inverse[A];
    ρ1 = ∑_{k=1}^{n} R₁ @@ Cs[[k]] - ∑_{k=1}^{2 n} φ[[k]] (g_{kk} - 1 / 2);
    Factor@{Δ, Δ² ρ1 /. g_{α_,β_} ⧴ G[[α, β]]}];
```