Pensieve Header: Computing rotation numbers. Based on Common.nb at pensieve://Classes/21-1350-KnotTheory/.

```
Print["Loading Rot.m from http://drorbn.net/ktc25/ap to compute rotation numbers."]
```

```
Rot::usage =
  "Rot[K] where K is any n-crossing knot presentation returns {Cs, φ}, where
    Cs is a length n list of crossings as triples {s,i,j}
    and φ is a lengtth 2n list of rotation numbers.";
```

In[•]:=
```
PD[epd_EPD] := PD @@ epd /. {X_{i_,j_} :> X[j, i + 1, j + 1, i], Overscript[X, -]_{i_,j_} :> X[j, i, j + 1, i + 1]}
```

```
Rot[pd_PD] := Module[{n, xs, x, rots, Xp, Xm, front = {1}, k},
   n = Length@pd; rots = Table[0, {2 n}];
   xs = Cases[pd, x_X :> {Xp[x[[4]], x[[1]]] PositiveQ@x
                          Xm[x[[2]], x[[1]]]     True   ];
   For[k = 1, k ≤ 2 n, ++k,
    If[FreeQ[front, -k],
     front = Flatten@Replace[front, k → (xs /. {
             Xp[k, l_] | Xm[l_, k] :> {l + 1, k + 1, -l},
             Xp[l_, k] | Xm[k, l_] :> (++rots[[l]]; {-l, k + 1, l + 1}),
             _Xp | _Xm :> {}
            }), {1}],
     Cases[front, k | -k] /. {k, -k} :> --rots[[k]];
    ]
   ];
   {xs /. {Xp[i_, j_] :> {+1, i, j}, Xm[i_, j_] :> {-1, i, j}}, rots}];
Rot[K_] := Rot[PD[K]];
```

In[•]:=
```
Features[K_] := Module[{Cs, φs, φ, k = 0, nk, s, i, j, res = 1},
  {Cs, φs} = Rot[K];
  nk = Table[If[φ == 0, ++k, res *= C_{++k}[φ]; ++k], {φ, φs}];
  Features[k, res * Times @@ Cases[Cs, {s_, i_, j_} :> X_{nk[[i]],nk[[j]]}[s]]]
 ]
```