Colourings[*k*, *m*] gives the number of colourings of the knot k,
    which is given in modified DT form onto the permutation group S_m.

```
Colourings[k_MDT, m_Integer] :=
  Colourings[k, m] = If[k === MDT[],
    Length /@ (Sort[Length /@
            (List @@ PermutationCycles@#)[[1]]] &
        // GroupBy[Permutations@Range@m, #] &
        // Values),
    Block[{e = EdgeSequence@k,
      s, v, w = List @@@ List @@ ToPD@k},
     s = SortBy[If[Order[Position[Join @@ e, #[[1]]],
            Position[Join @@ e, #[[3]]]] == 1,
          #, Reverse@#] & /@
        (w //. (Max@# → Min@# & /@ w[[ ;; , {3, 5}]]))[[
          ;; , 2 ;; 4]],
       Max@Table[Position[Join @@ e, #[[j]]], {j, 2}] &];
     (*In s, the third values are
      to be derived from the first two.*)
     Total /@ Table[If[ValidColouring[
         w, e[[1]], s, g], 1, 0],
        {p, (Length /@ (List @@ PermutationCycles@#)[[1]]
            // Sort) &
          // GroupBy[Permutations@Range@m, #] &
          // Values},
        {g, Tuples[p, Length@e[[1]]]}]]];
```