

ToPD@k_MDT := ToPD@k =

```
Block[{a = Abs /@ k, n = Length@k, o, r},
  o = Ordering@a;
  Do[If[PlanarGraphQ@Graph[Join@@Table[
    Array[{v, # - 1}  $\leftrightarrow$  {v, #} &, 3]  $\cup$ 
    {{v, 0}  $\leftrightarrow$  {v, 3}}]  $\cup$ 
    Join@@({{v, #[[1]]}  $\leftrightarrow$  {#[[2]],
      #[[1]] + (1 - c[[v]] c[[#[[2]]]]} / 2},
    {v, 3 - #[[1]]}  $\leftrightarrow$  {#[[2]],
      #[[1]] + (1 + c[[v]] c[[#[[2]]]]} / 2}} &
    /@ ({#[[1]], o[[Mod[v - # / 2, n, 1]]]} & /@
      {0, 2})],
    {v, n}]]],
  (*The crossing assignment
    c is a valid assignment.*)
  r =
  c;
  Break[]], {c, Tuples[{1, -1}, n]};
  PD@@(X### & @@@Array[
    {2 # - 1, 2 a[[#]], 2 #, Mod[2 a[[#]] + 1, 2 n, 1]}
    [[If[Sign@k[[#]] == 1, ;;, {2, 3, 4, 1}]]
    [[If[r[[#]] == 1, ;;, {1, 4, 3, 2}]] &, n]]];
```