

```

In[*]:= D1 = PD[X[1, 5, 2, 4], X[5, 3, 6, 2], X[3, 1, 4, 6]];
D2 = PD[X[4, 1, 5, 2], X[2, 5, 3, 6], X[6, 3, 1, 4]];
K41 = PD[X[4, 2, 5, 1], X[8, 6, 1, 5], X[6, 3, 7, 4], X[2, 7, 3, 8]];
ConwayK = PD[X[4, 2, 5, 1], X[8, 4, 9, 3], X[12, 5, 13, 6],
  X[2, 8, 3, 7], X[9, 17, 10, 16], X[11, 18, 12, 19], X[6, 13, 7, 14],
  X[15, 20, 16, 21], X[17, 1, 18, 22], X[19, 14, 20, 15], X[21, 10, 22, 11]];
PK = PD[
  X[4, 48, 5, 47], X[5, 40, 6, 41], X[6, 68, 7, 67], X[11, 97, 12, 96],
  X[12, 62, 13, 61], X[13, 26, 14, 27], X[14, 82, 15, 81], X[20, 105, 21, 106],
  X[22, 43, 23, 44], X[23, 65, 24, 64], X[24, 9, 25, 10], X[25, 99, 26, 98],
  X[29, 18, 30, 19], X[30, 90, 31, 89], X[31, 2, 32, 3], X[32, 76, 33, 75],
  X[35, 53, 36, 52], X[36, 72, 37, 71], X[39, 49, 40, 48], X[44, 21, 45, 22],
  X[45, 87, 46, 86], X[50, 38, 51, 37], X[51, 70, 52, 71], X[54, 34, 55, 33],
  X[55, 74, 56, 75], X[56, 4, 57, 3], X[57, 88, 58, 89], X[58, 20, 59, 19],
  X[62, 97, 63, 98], X[63, 11, 64, 10], X[68, 49, 69, 50], X[69, 39, 70, 38],
  X[72, 53, 73, 54], X[73, 35, 74, 34], X[76, 2, 77, 1], X[77, 90, 78, 91],
  X[78, 18, 79, 17], X[82, 99, 83, 100], X[83, 9, 84, 8], X[84, 65, 85, 66],
  X[85, 43, 86, 42], X[87, 105, 88, 104], X[92, 16, 93, 15], X[93, 80, 94, 81],
  X[94, 28, 95, 27], X[95, 60, 96, 61], X[100, 8, 101, 7], X[101, 66, 102, 67],
  X[102, 42, 103, 41], X[103, 46, 104, 47], X[106, 60, 107, 59], X[107, 28, 108, 29],
  X[108, 80, 109, 79], X[109, 16, 110, 17], X[110, 92, 1, 91]
];

In[*]:= KhSize[pd_] := Module[{w, front, TL, todo, v, x, t1, t2, t3, t4},
  w = Plus @@ (pd /. {
    X[i_, j_, k_, l_] /; j - l == 1 ∨ l - j > 1 ∴ 1,
    X[i_, j_, k_, l_] /; l - j == 1 ∨ j - l > 1 ∴ -1
  });
  SetAttributes[p, Orderless];
  front = {};
  TL = 1;
  todo = List @@ pd;
  v[x_] := Length[front ∩ List @@ x];
  While[Length[todo] > 0,
    x = RandomChoice[MaximalBy[todo, v]];
    t1 = TL (x /. X[i_, j_, k_, l_] ∴ p[i, j] p[k, l] + p[i, l] p[j, k]);
    t2 = Expand[t1];
    t3 = t2 /. p[i_, j_] p[j_, k_] ∴ p[i, k];
    TL = t3 /. {p[i_, i_] ∴ 2, p[i_, j_]² ∴ 2};
    todo = Complement[todo, {x}];
    front = Complement[front ∪ List @@ x, front ∩ List @@ x]
  ];
  TL
]

```

```
In[*]:= KhSize /@ {D1, D2, K41, ConwayK, PK}
Out[*]= {30, 30, 66, 23 118, 62 817 105 453 162 044 382}
```

```
In[*]:= Length[PK]
Out[*]= 55
```

```
In[*]:= 62 817 105 453 162 044 3821/55 // N
Out[*]= 2.29068
```