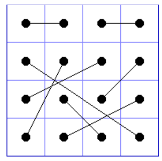
Theorem 5 [connection figure (1122 3456 5768 4873)]



Let M be a general 4x4 magic square of connection figure (1122 3456 5768 4873), then there exist integer numbers k,r such that:

```
    k+ 7r  k+14r  k      k+21r
    k+15r  k+13r  k+ 9r  k+ 5r
M = k+12r  k+ 4r  k+16r  k+10r.
    k+ 8r  k+11r  k+17r  k+ 6r
```

By k+tr -> 1+r, 0<t, and k -> 1 the square M is mapped onto a general magic square with entries from the symmetric set {1,5,6,7,8,9,10,11,12,13,14,15,16,17,18,22}.

Since for N=22 there are only the 2 possibilities: k=1, r=1 or k=22, r=-1, any general 4x4 general magic square of connection figure (1122 3456 5768 4873), with entry 1, can be derived from either k=1, r=t or k=N, r=-1, where N=1+21t, 0<t.

Proof

By solving the linear equations for M.

Remark

There is a one to one mapping F from the set of general 4x4 magic squares of connection figure (1122 3456 5678 8347) onto the set of general 4x4 magic squares of connection figure (1122 3456 5678 4873),

```
    c01 c02 c03 c04       c04 c03 c02 c01
    c05 c06 c07 c08       c10 c12 c09 c11
F:  c09 c10 c11 c12  -->  c07 c05 c08 c06.
    c13 c14 c15 c16       c13 c15 c14 c16
```

Moreover, there is an injection i from the set of 4x4 general magic squares with connection figure (1122 3456 5768 4873) into the set of 4x4 general magic squares of connection figure (1122 3443 5665 7788), defined by

```
    c01 c02 c03 c04       c03 c04 c13 c06
    c05 c06 c07 c08       c09 c12 c14 c07
i:  c09 c10 c11 c12  -->  c11 c10 c15 c08.
    c13 c14 c15 c16       c02 c01 c16 c05
```