```
diag = Diag[ar[1, 3], ar[4, 6], ar[5, 2]]
```

```
Diag[ar[1, 3], ar[4, 6], ar[5, 2]]
```

```
p = Times @@ (diag /. ar[i_, j_] :> eq[i, j - 1] eq[i - 1, j] ltheq[i - 1, i])
```

```
eq[0, 3] eq[1, 2] eq[3, 6] eq[4, 2] eq[4, 5] eq[5, 1] ltheq[0, 1] ltheq[3, 4] ltheq[4, 5]
```

```
p = (p
     /. {rule = Cases[p, eq[i_, j_] :> (i → j), Infinity, 1];
      eq[ij__] :> (eq[ij] /. rule),
      ltheq[ij__] :> (ltheq[ij] /. rule)
     }
    /. {
     eq[i_, i_] → 1
    }
 )
```

```
ltheq[5, 5] ltheq[6, 5]^2
```

```
p = Times @@ (diag /. ar[i_, j_] :> eq[i, j - 1] eq[i - 1, j] ltheq[i - 1, i]);
While[! FreeQ[p, eq],
 p = (p
      /. Cases[p, eq[i_, j_] :> (i → j), Infinity, 1]
     /. {
      eq[i_, i_] → 1
     }
  )
]
```

```
p
```

```
ltheq[5, 5] ltheq[6, 5]^5
```

```
l = Length[indices = Union @@ Cases[{p}, ltheq[i_, j_] :> {i, j}, Infinity]]
```

```
2
```

```
indices
```

```
{5, 6}
```

```
ineqs = p /. e_ltheq :> (e /. Thread[indices → Range[l]])
```

```
ltheq[1, 1] ltheq[2, 1]^5
```

```
Expand[Plus @@ (Times[
       ineqs /. ltheq[i_, j_] :> Switch[
          Order[#[[i]], #[[j]]],
          1, 1,
          0, 1 / 2,
          -1, 0
         ],
       Binomial[n, Max[#]]
      ] & /@ OrderTypes[l])]
```

$$-\frac{15\,n}{64}+\frac{n^2}{4}$$

```
Wgl[diag]
```

$$\frac{n}{4}$$