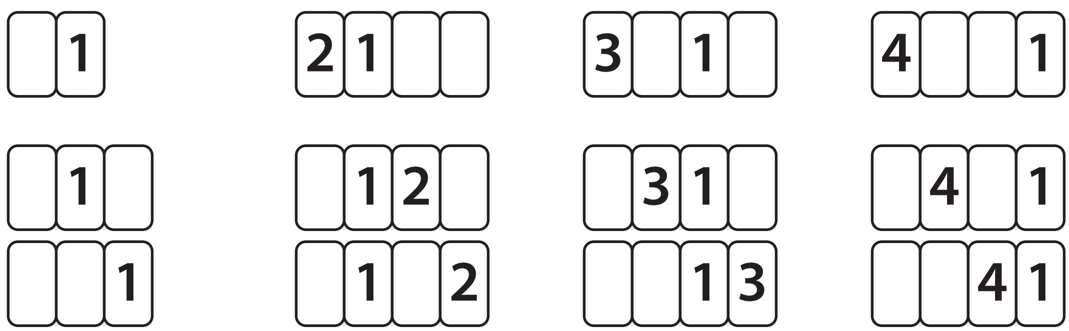
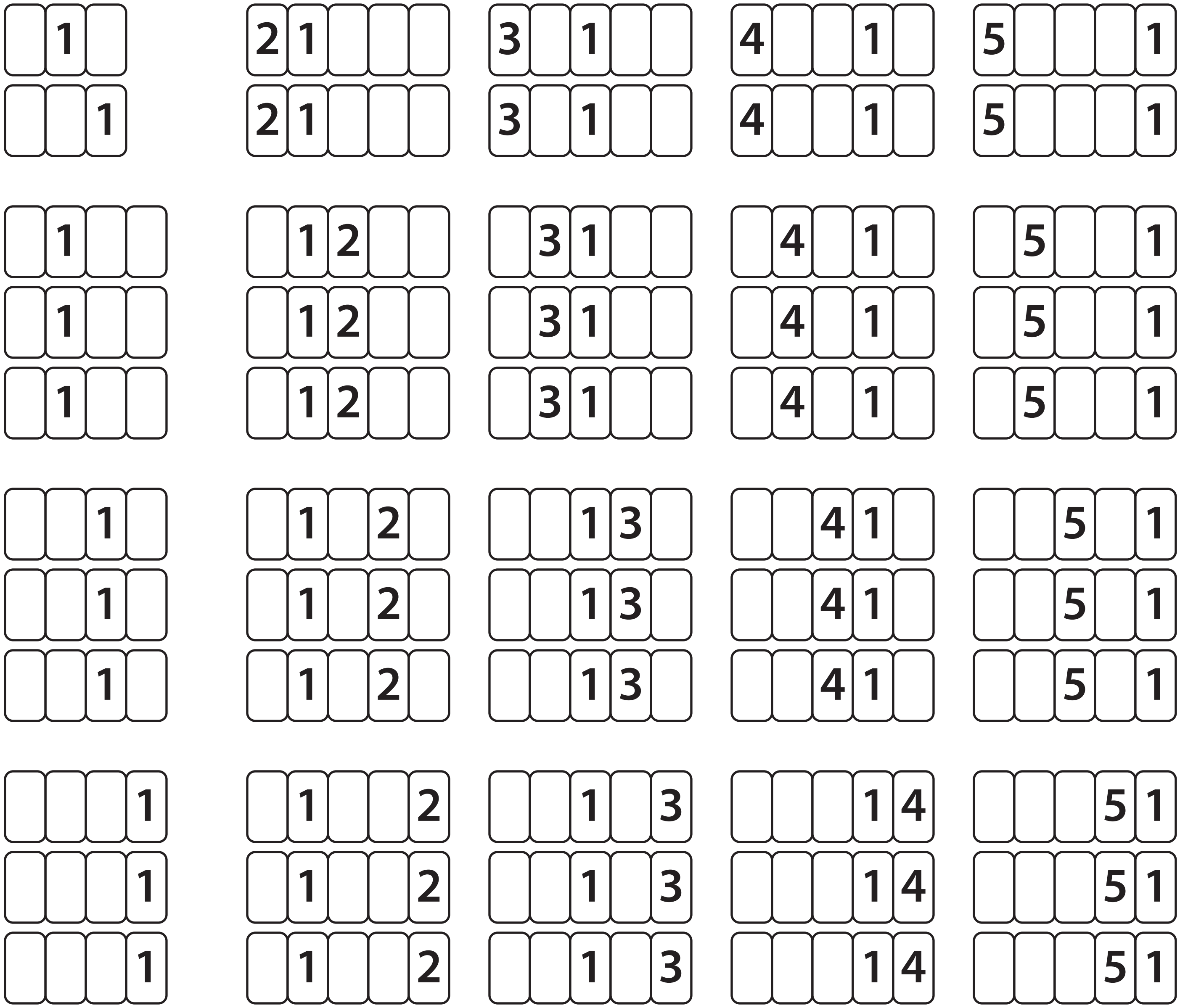



Fill in this table of the nine derangments of **1 2 3 4**, using the one derangement of **1 2**, and the two derangements of **1 2 3**.

This illustrates the recurrence **f(4) = 3 (f(2) + f(3))** where **f(n)** is the number of derangements of **n** elements. The general case is **f(n) = (n-1) (f(n-2) + f(n-1))**.



Fill in this table of the 44 derangments of **1 2 3 4 5**, using the two derangements of **1 2 3**, and the nine derangements of **1 2 3 4**.

This illustrates the recurrence **f(5) = 4 (f(3) + f(4))** where **f(n)** is the number of derangements of **n** elements. The general case is **f(n) = (n-1) (f(n-2) + f(n-1))**.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   | 1 |   |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   | 1 |   |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   | 1 |   |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   | 1 |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   | 1 |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   | 1 |   |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   |   | 1 |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   |   | 1 |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
|   |   |   | 1 |   | 2 | 1 |   |   |   |   | 3 |   | 1 |   |   |   | 4 |   |   | 1 |   |   | 5 |   |   |   | 1 |   | 6 |   |   |   |   | 1 |
| 2 | 1 |   |   |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
| 2 | 1 |   |   |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 | 2 |   |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 | 2 |   |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 | 2 |   |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   | 2 |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   | 2 |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   | 2 |   |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   |   | 2 |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   |   | 2 |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
|   | 1 |   |   | 2 |   | 1 | 2 |   |   |   |   | 3 | 1 |   |   |   |   | 4 |   | 1 |   |   |   | 5 |   |   | 1 |   |   | 6 |   |   |   | 1 |
| 3 |   | 1 |   |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
| 3 |   | 1 |   |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   | 3 | 1 |   |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   | 3 | 1 |   |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   | 3 | 1 |   |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 | 3 |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 | 3 |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 | 3 |   |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 |   | 3 |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 |   | 3 |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
|   |   | 1 |   | 3 |   | 1 |   | 2 |   |   |   |   | 1 | 3 |   |   |   |   | 4 | 1 |   |   |   |   | 5 |   | 1 |   |   |   | 6 |   |   | 1 |
| 4 |   |   | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
| 4 |   |   | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   | 4 |   | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   | 4 |   | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   | 4 |   | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   | 4 | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   | 4 | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   | 4 | 1 |   |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   |   | 1 | 4 |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   |   | 1 | 4 |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
|   |   |   | 1 | 4 |   | 1 |   |   | 2 |   |   |   | 1 |   | 3 |   |   |   |   | 1 | 4 |   |   |   |   | 5 | 1 |   |   |   |   | 6 |   | 1 |
| 5 |   |   |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
| 5 |   |   |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   | 5 |   |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   | 5 |   |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   | 5 |   |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   | 5 |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   | 5 |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   | 5 |   | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   |   | 5 | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   |   | 5 | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |
|   |   |   | 5 | 1 |   | 1 |   |   |   | 2 |   |   | 1 |   |   | 3 |   |   |   | 1 |   | 4 |   |   |   |   | 1 | 5 |   |   |   |   | 6 | 1 |