Exercise 1.4

After computing the GF(8) and GF(9), I got these tables.

GF(8) addition table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | 1 | 0 | 3 | 2 | 5 | 4 | 7 | 6 |
| 2 | 2 | 3 | 0 | 1 | 6 | 7 | 4 | 5 |
| 3 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 |
| 4 | 4 | 5 | 6 | 7 | 0 | 1 | 2 | 3 |
| 5 | 5 | 4 | 7 | 6 | 1 | 0 | 3 | 2 |
| 6 | 6 | 7 | 4 | 5 | 2 | 3 | 0 | 1 |
| 7 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

GF(8) multiplication table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | 0 | 2 | 4 | 6 | 3 | 1 | 7 | 5 |
| 3 | 0 | 3 | 6 | 5 | 7 | 4 | 1 | 2 |
| 4 | 0 | 4 | 3 | 7 | 6 | 2 | 5 | 1 |
| 5 | 0 | 5 | 1 | 4 | 2 | 7 | 6 | 6 |
| 6 | 0 | 6 | 7 | 1 | 5 | 3 | 2 | 4 |
| 7 | 0 | 7 | 5 | 2 | 1 | 6 | 4 | 3 |

GF(9) addition table

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1 | 0 | 3 | 2 | 5 | 4 | 7 | 6 | 7 |
| 2 | 2 | 3 | 0 | 1 | 6 | 7 | 4 | 5 | 6 |
| 3 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 5 |
| 4 | 4 | 5 | 8 | 7 | 0 | 1 | 2 | 3 | 4 |
| 5 | 5 | 4 | 7 | 6 | 1 | 0 | 3 | 2 | 3 |
| 6 | 6 | 8 | 4 | 8 | 2 | 8 | 0 | 1 | 2 |
| 7 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 1 |
| 8 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

GF(9) multiplication table

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 3 |
| 2 | 0 | 2 | 4 | 6 | 3 | 1 | 7 | 5 | 2 |
| 3 | 0 | 3 | 6 | 5 | 7 | 4 | 1 | 2 | 3 |
| 4 | 0 | 4 | 3 | 7 | 6 | 2 | 5 | 1 | 5 |
| 5 | 0 | 5 | 1 | 4 | 2 | 7 | 6 | 6 | 4 |
| 6 | 0 | 1 | 2 | 1 | 5 | 3 | 2 | 4 | 3 |
| 7 | 0 | 2 | 5 | 2 | 1 | 6 | 4 | 3 | 2 |
| 8 | 0 | 3 | 2 | 3 | 5 | 4 | 3 | 2 | 1 |