# Supplemental material for Visual Algebra (Math 4120), HW 14

**#1**: The additive Cayley table of the finite field $\mathbb{F}_9 \cong \mathbb{F}_3[x]/(x^2+x+2)$.

| $+$ | $0$ | $1$ | $2$ | $x$ | $x+1$ | $x+2$ | $2x$ | $2x+1$ | $2x+2$ |
|---|---|---|---|---|---|---|---|---|---|
| $0$ | | | | | | | | | |
| $1$ | | | | | | | | | |
| $2$ | | | | | | | | | |
| $x$ | | | | | | | | | |
| $x+1$ | | | | | | | | | |
| $x+2$ | | | | | | | | | |
| $2x$ | | | | | | | | | |
| $2x+1$ | | | | | | | | | |
| $2x+2$ | | | | | | | | | |

**#1**: The multiplictive Cayley table of the finite field $\mathbb{F}_9 \cong \mathbb{F}_3[x]/(x^2+x+2)$.

| $\times$ | $1$ | $2$ | $x$ | $x+1$ | $x+2$ | $2x$ | $2x+1$ | $2x+2$ |
|---|---|---|---|---|---|---|---|---|
| $1$ | | | | | | | | |
| $2$ | | | | | | | | |
| $x$ | | | | | | | | |
| $x+1$ | | | | | | | | |
| $x+2$ | | | | | | | | |
| $2x$ | | | | | | | | |
| $2x+1$ | | | | | | | | |
| $2x+2$ | | | | | | | | |

**#1**: The additive Cayley table of the finite field $\mathbb{F}_9 \cong \mathbb{F}_3[x]/(x^2+x+2)$.

| $+$ | $0$ | $1$ | $-1$ | $x$ | $x+1$ | $x-1$ | $-x$ | $-x+1$ | $-x-1$ |
|---|---|---|---|---|---|---|---|---|---|
| $0$ | | | | | | | | | |
| $1$ | | | | | | | | | |
| $-1$ | | | | | | | | | |
| $x$ | | | | | | | | | |
| $x+1$ | | | | | | | | | |
| $x-1$ | | | | | | | | | |
| $-x$ | | | | | | | | | |
| $-x+1$ | | | | | | | | | |
| $-x-1$ | | | | | | | | | |

**#1**: The multiplictive Cayley table of the finite field $\mathbb{F}_9 \cong \mathbb{F}_3[x]/(x^2+x+2)$.

| $\times$ | $1$ | $-1$ | $x$ | $x+1$ | $x-1$ | $-x$ | $-x+1$ | $-x-1$ |
|---|---|---|---|---|---|---|---|---|
| $1$ | | | | | | | | |
| $-1$ | | | | | | | | |
| $x$ | | | | | | | | |
| $x+1$ | | | | | | | | |
| $x-1$ | | | | | | | | |
| $-x$ | | | | | | | | |
| $-x+1$ | | | | | | | | |
| $-x-1$ | | | | | | | | |