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1. Let $\alpha$ be the root of $m(x)=x^2+4$ in $\mathbb{F}_7[x]$.

$m(\alpha)=0=\alpha^2+4 \Rightarrow \alpha^2=-4\equiv 3 \mod 7$.

$\Rightarrow \alpha^4=9 \mod 7 \equiv 2 \mod 7 \Rightarrow \alpha^8=4 \mod 7 \Rightarrow \alpha^{16}=16 \mod 7 \equiv 2 \mod 7$.

$\Rightarrow \{\alpha^2, \alpha^4, \alpha^8\}$ are primitive elements.

$\Rightarrow ord(\alpha^2)=3$.

2. (1 1) represents $x+1$ and (2 2) represents $2x+2$.

$x+a$ for $a=0,1,\cdots,48$.

$x^2+x+a$ for $a=0,\cdots,48$ except $0, 7, 42$.

$x^2+a$ for $a=0,\cdots,48$ except $0, 13, 36, 25, 24, 40, 48$.

3. $x+a$ for $a=0,\cdots,48$

$x^2+x+a$ for $a=0,\cdots,48$ except $0,7,42$.

$x^2+a$ for $a=0,\cdots,48$ except $0, 13, 24, 25, 36, 40, 48$.

4. $x+1$, $x$, $x+2$, $x+3$, $x+4$, $x+5$, $x+6$.

$x^2+x+1$, $x^2+x+2$, $x^2+x+3$, $x^2+x+4$, $x^2+x+5$, $x^2+x+6$.

$x^2+1$, $x^2+2$, $x^2+4$, $x^2+5$