

Poly nomials of degree 2 and 3 are irreducible if and only if they have a root in \mathbb{F}_q

$g(x)$, $\deg(g(x)) = 2$ $h(x) \in \mathbb{F}_q[x]$
 $\deg(h(x)) = \deg(f(x)) = 1$

$g(x)$ has a divisor of degree 1

$$g(x) = \frac{(x+c) \cdot h(x)}{(x-1)}$$

$(x^2 + x + 1)$

irreducible in \mathbb{F}_2

reducible in \mathbb{F}_3 (root is 1)

irreducible in \mathbb{F}_5

reducible in \mathbb{F}_7 (root is 6)

reducible \mathbb{F}_{13} (root is 3)

irreducible F_n