$\mathbb{Z}^* = \{-1, +1\}$ $A^* = \mathbb{F}_q[T]^*$

$2 \longleftrightarrow q-1$

prime polynomial = monic irred $P \in \mathbb{F}_q[T]$.

$\# A/PA = q^{\deg(P)}$

"Number Theory in Function Fields"

by: M. Rosen

$$\varphi(n) = \# (\mathbb{Z}/n\mathbb{Z})^*$$

$$a^{\varphi(n)} \equiv 1 \pmod{n}$$

$$a^{p-1} \equiv 1 \pmod{p}$$

$A = \mathbb{F}_q[T]$

$\mathbb{Z}$	$\mathbb{F}_q[T]$
1	$1/\log q$

$$\zeta_A(s) = \sum_{\substack{f \text{ monic} \\ f \in \mathbb{F}_q[T]}} \frac{1}{|f|^s} = \sum_{d=0}^{\infty} \sum_{\substack{f \text{ monic} \\ f \in \mathbb{F}_q[T] \\ \deg(f)=d}} \frac{1}{|f|^s}$$

$$\frac{1}{|f|^s} = \frac{1}{q^{ds}}$$

$$\zeta_A(s) = \frac{1}{1-q^{1-s}} \qquad = \sum_{d=0}^{\infty} \frac{1}{q^{ds}} \cancel{\sum_{\deg(f)=d} 1} \; q^d$$

$$\pi(x) \sim \frac{x}{\log x}$$

$$\pi_A(n) = \frac{q^n}{n} + O\left(\frac{q^{n/2}}{n}\right)$$

$$\boxed{q^n = x} \quad = \frac{x}{\log_q(x)} + O\left(x^{1/2}/\log_q(x)\right)$$

$\mathbb{Z}$	$\mathbb{F}_q[T]$
x	q^n
$\ln x$	$\log_q q^n = \deg(f)$

$$\lim_{n\to\infty} \frac{1}{q^n} \sum_{\deg(f)=n} F(f) = \lim_{n\to\infty} \frac{1}{1+q+\cdots+q^n} \sum_{\deg(f)\leq n} F(f)$$