$23941 \equiv 5 \quad (11)$

$915 \equiv 2 \quad (11)$

$5x \equiv 2 \quad (11) \Rightarrow x \equiv -4 \quad (11)$

$x \equiv 3 \quad (4) \qquad x = 4t+3 = 4(81s+39)+3$

$x \equiv -3 \quad (81)$

$= 324s + 159$

$= 324(11r+7)+159$

$4t+3 \equiv -3 \quad (81) \qquad = 3564r + 2427$

$81t \equiv 0$

$4t \equiv -6 \quad (81)$

$t \equiv 120 \equiv 39 \quad (81)$

$t = 81s + 39$

$x \equiv -4 \quad (11)$

$324s + 159 \equiv -4 \quad (11)$

$11s \equiv 0 \quad (11)$

$5s \equiv 2 \quad (11)$

$s \equiv 7 \quad (11)$

$$a = p_1^{n_1} \cdots p_k^{n_k}$$

$$k=1: \quad a = p^n$$

$$\sigma(a) = 1 + p + p^2 + \dots + p^n$$
$$= \frac{p^{n+1}-1}{p-1}$$

$$p \equiv a \pmod{m} \qquad \Phi \quad \varphi$$

$$p \equiv 9 \pmod{12}$$

$$f(a) = f\left(p_1^{\alpha_1} \cdots p_k^{\alpha_k}\right)$$
$$= f(p_1^{\alpha_1}) \cdot f\left(p_2^{\alpha_2} \cdots p_k^{\alpha_k}\right)$$
$$\vdots$$
$$= f(p_1^{\alpha_1}) \cdot f(p_2^{\alpha_2}) \cdots f(p_k^{\alpha_k})$$

$\varphi(6)$ $\qquad (a,n) = (a+n,n)$

$\boxed{1 \quad 7}$

$\cancel{2} \quad \cancel{8}$

$\cancel{3} \quad \cancel{9}$

$\cancel{4} \quad \cancel{10}$

$\boxed{5 \quad 11}$

$\cancel{6} \quad \cancel{12}$

$$\varphi(p_1^{\alpha_1} \cdots p_k^{\alpha_k}) = (p_1^{\alpha_1} - p_1^{\alpha_1 - 1}) \cdots (p_k^{\alpha_k} - p_k^{\alpha_k - 1})$$

$$\varphi(72) = \varphi(2^3 \cdot 3^2) = (2^3 - 2^2)(3^2 - 3^1)$$
$$= 4 \cdot 6 = 24$$

$\cancel{0}$

$1 \longmapsto 3 \cdot 1 \equiv 3$

$2 \longmapsto 3 \cdot 2 \equiv 1$

$3 \longmapsto 3 \cdot 3 \equiv 4$

$4 \longmapsto 3 \cdot 4 \equiv 2$

$a \equiv 3 \mod 5$

n	0	1	2	3	4	5	6
$2^n \pmod 9$	1	2	4	-1	-2	-4	1

$$a^0 \equiv a^{\varphi(m)} \ (m) \Rightarrow 0 \equiv \varphi(m) \quad (r)$$

E.v. $\quad \Leftarrow \quad r \mid \varphi(m)$

$$a^t \equiv a^s \pmod m \Leftarrow t \equiv s \pmod{\varphi(m)}$$

$(a,m)=1$