$$7^{18} = 7 \times 7 \times \cdots \times 7 \equiv \ ? \ \mod 19$$

$$\underbrace{}_{18}$$

$$7^4 \equiv 7 \mod 19$$

$$7^8 = 7^{4 \cdot 2} = \left(7^4\right)^2$$

$$\equiv 7^2 \quad (\mod 19)$$

$$\equiv 49 \equiv 11 \ (\mod 19)$$

F.L.T.

$$\Rightarrow 7^{18} \equiv 1 \ (\mod \underline{19})$$

$$5^0 = 1$$

$$a^0 = 1$$

$$\phi(100) = ?$$

$$p_1 = 2, \quad p_2 = 5$$
$$a_1 = 2 \quad a_2 = 2$$

$$\phi(100) = \phi(2^2 \cdot 5^2)$$

$$= 2^1 \cdot 1 \cdot 5^1 \cdot 4$$

$= 40$

this will be all the integers $1 \le a \le 99$
that have no factors of 2 or 5.