1. Prove that (a + p)^n(mod p) =a^n(mod p)

Using binomial theorem,

On applying this to (a + p)^n(mod p)=a^n+p^n mod p

rest of the terms becomes 0 since(p mod p=0)

(a + p)^n(mod p)=a^n+p^n mod p

=a^n mod p + p^n mod p

=a^n mod p + 0

=a^n mod p