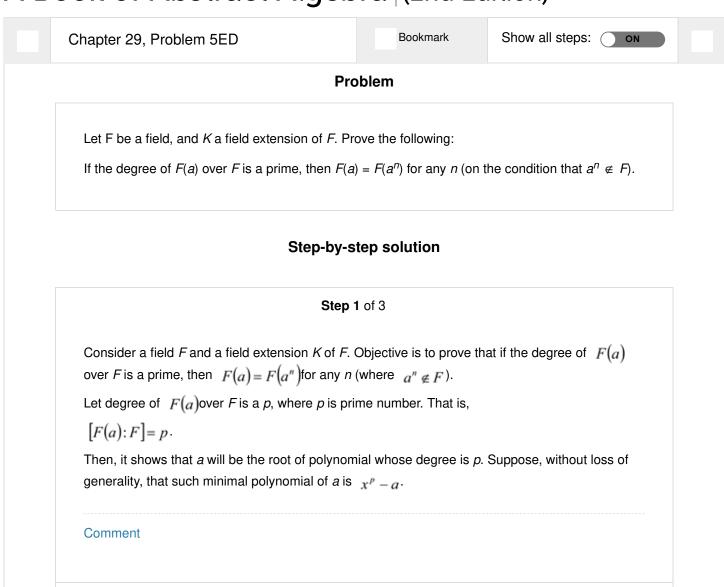
A Book of Abstract Algebra (2nd Edition)



Step 2 of 3

The corresponding equation of irreducible polynomial $x^p - a$ will be

$$x^p - a = 0$$

Then $x = a^{1/p}$. The basis for F(a) over F will be:

$$\{1, a^{1/p}, a^{2/p}, ..., a^{(p-1)/p}\}$$

For some integer n, $\gcd(n,p)=1$ because p is prime. Observe that, remainder of n when divided by p will be one of the $\{1,2,3,\ldots,p-1\}$. That is, the basis for $F(a^n)$ will be same as $\{1,a^{1/p},a^{2/p},\ldots,a^{(p-1)/p}\}$ when $a^n\notin F$.

Comment

Step 3 of 3

Hence, if degree of F(a) over F is a prime, then $F(a) = F(a^n)$ for any n (where $a^n \notin F$).

Comment