Scan through Rhee on Galois **7.13.91**

I have just perused the Chapter 2 stuff before the start of Galois Fields. I am beginning now to see why I was so confused reading this before.

Rhee *defines* a primitive polynomial as being any irreducible monic, top of page 25. This is very different from my definition. Thus, when we get over to page 27, I was very surprised to suddenly learn that p(x) has the property that $p(\alpha) = 0$ for some primitive element. I think he has just plain goofed this up. He knows the right definition, but he has stated things wrong.

Now lets try to line up his theorems with mine:

- He does not use the term "period" but claims that prim polys have period as I do in my Fact 4.

- His definition of characteristic is vague, I understand it to be p.

- He does not keep a consistent notation as I tried to do with q, p, m.

Theorem 2.8 is my Chapter 4 version of my Chapter 2 thing. My proof is better I think.

Lemma 2.8.1: The generalized expansion theorem. Why is it a lemma?

Theorem 2.9: Shows that $\alpha^{q-1} = 1$. This is my Big Theorem 2 (4), Chapter 4.

Theorem 2.10 is my Fact 4 Chapter 4: order of β divides exponent you see. But he does only the case exponent = q-1. His thing is provable by just stating coset decomp.

He shows that α^p is also a primitive element if α is, thus conjugates are. I have more specific stuff on this in Fact 12 of Chapter 4, then FAct 8(b) of Chapter 5.

Theorem 2.11 is my Fact 6 of Chapter 5.

he uses same term conjugates of α.

Theorem 2.12: this is my Big Theorem 2, seems out of place for his development.

He defines the "minimal polynomial" in equivalanet way to me.

Theorem 2.13: the m(x) is irreducible. , my Fact 2(c) Chapter 5

Theorem 2.14: my Fact 1.

Theorem 2.15: my Fact 3.

Theorem 2.16: part of my big Theorem 3.

Theorem 2.17: my Fact 6.

Theorem 2.18: my Big Theorem 3.

On page 32 he has comment opn a splitting field, I do not get it. Unclear, just stuck in.

So this is the end of Rhee's chapter 2 on Abstract Algebra. I finally have this under control, but it really required me to replace the entire chapter with my own notes. Rhee was very dense, could have put stuff in better order, had a few bugs. But he gave lots of hints that I was able to use.

Galois returns in Chapter 5 and Chapter 7 for Rhee. There are more connections to be made.