

Help with theorem proof

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I would appreciate if anybody could provide a clear explanation to the theorem 12.4 on page 183 of Oliver Pretzel's book "Error Correcting Codes and Finite Fields", OUP 1992.

I am getting stuck on the critical passage:

....'Let $\text{ord}(\alpha) = n$ and $\text{ord}(\beta) = m$. If m does not divide n , there must be a prime r for which the highest power $x=r^k$ dividing m is greater than the highest power $y=r^l$ dividing n .' ... etc

I can follow the proof of (another version of) this theorem on Blahut's book (Algebraic Codes ...) without trouble, but I am stuck on this one.

Apologies to the professionals, I am just an amateur.

Thank you,
ASM

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