Problem: 2 77 to to asserble 149 and to years of the edino All False there of the residence. So has order 6 = 2.3 and in non-abellian. There in a standard theorem: it | at = 12 with Primer PLA and Pt (a-1), then or in excirc (hence (abelian) 213 ittl stort spoone ros word. H = EH But when PI (1-1) nonabelian semidirect freducto [may 24 mosts 1-141 + 100m 60 0 215 NOT (11) IN THE NORTHALIZER Of H. SMCC. HEN WE- Wase. K= [6.: Nor (4)] & [6:4].

BI True.

Every grant of order pr in abelian. let |al = pr. The center Z(Ge) in nontrivial (class equation). It 12(a) = pr then a = z(a) in abelian If | z(a) | = P then Gy(z(Gy)) has order Phence in eyelie implying of in abelian. Thus in all cases of in abelian is war of If G = Cpr (cyclic) then there in exactly, one subgroup of order p.

Problem 19

If G= CPXCP then there are exactly PH Subgrown of order P.

50, G has PHI Subnouth of order Pit and only if a = cpxcp. 型 Folse.

then Gin abelian.

Thank in a standard their it of suntil tell this Let the dintinct conjugates bethe He where H2 = H. Each conjugate how | HI elements Tuo dirtincticonjugates intersect in a swindir of Size at mont |HI-1. also K = [G. ! NG (H)] where NG (H) in the normalizer of H. Since H⊆NG(H) we have, $K = [G:NG(H)] \leq [G:H].$

De how onder 6 = 2.3 and in

El False

Gr = 53. take N = 2 (123) > (onder 3), which in normal and cyclic. The Austient So/N has order 2 and in cyclic. But So in non-abelian.

So both N and Gr/N Cyclic does not force Gr abelian.

work in the infinite cyclic group LN). Let a=x and b=x. Then at=6, and ab=ta. But (ab)6 = (x.xl)6=x18 te. So the conclusion (ab)6 = e in not generally true without extra hypotheses.

If there in exactly one subgroup of order protent then that subgroup is writing and therefore normal.