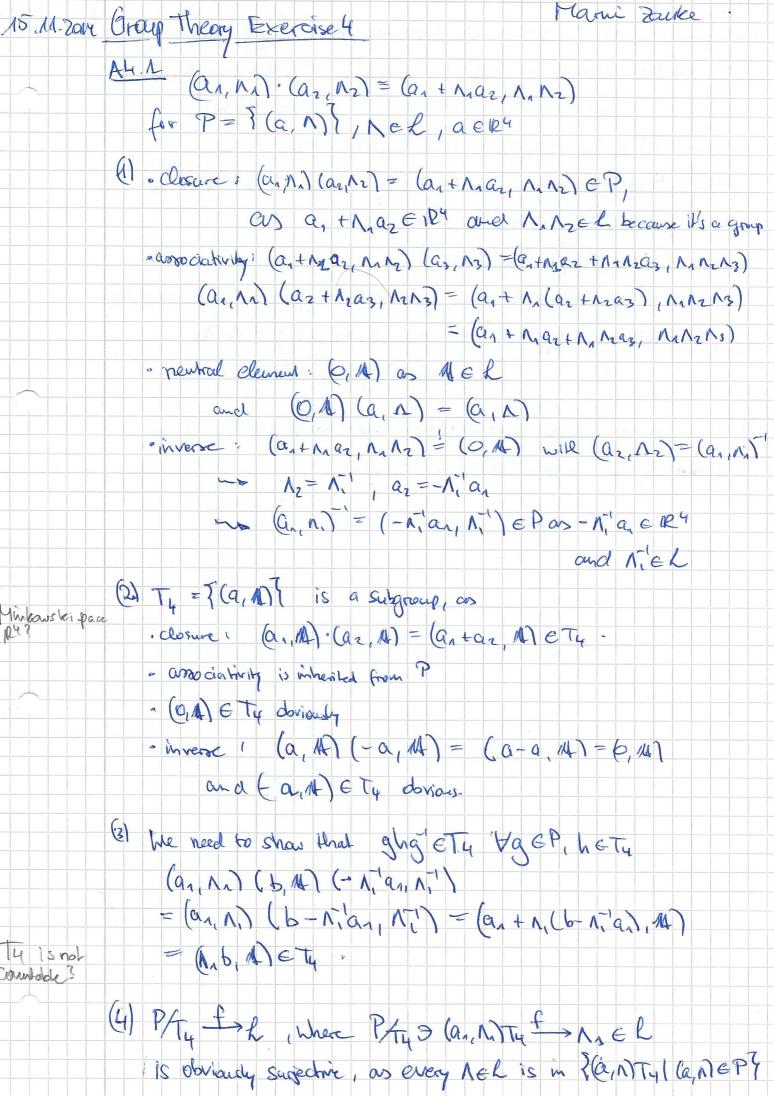
Disclaimer

The solution at hand was written in the course of the respective class at the University of Bonn. If not stated differently on top of the first page or the following website, the solution was prepared and handed in solely by me, Marvin Zanke. Anything in a different color than the ball pen blue is usually a correction that I or a tutor made. For more information and all my material, check:

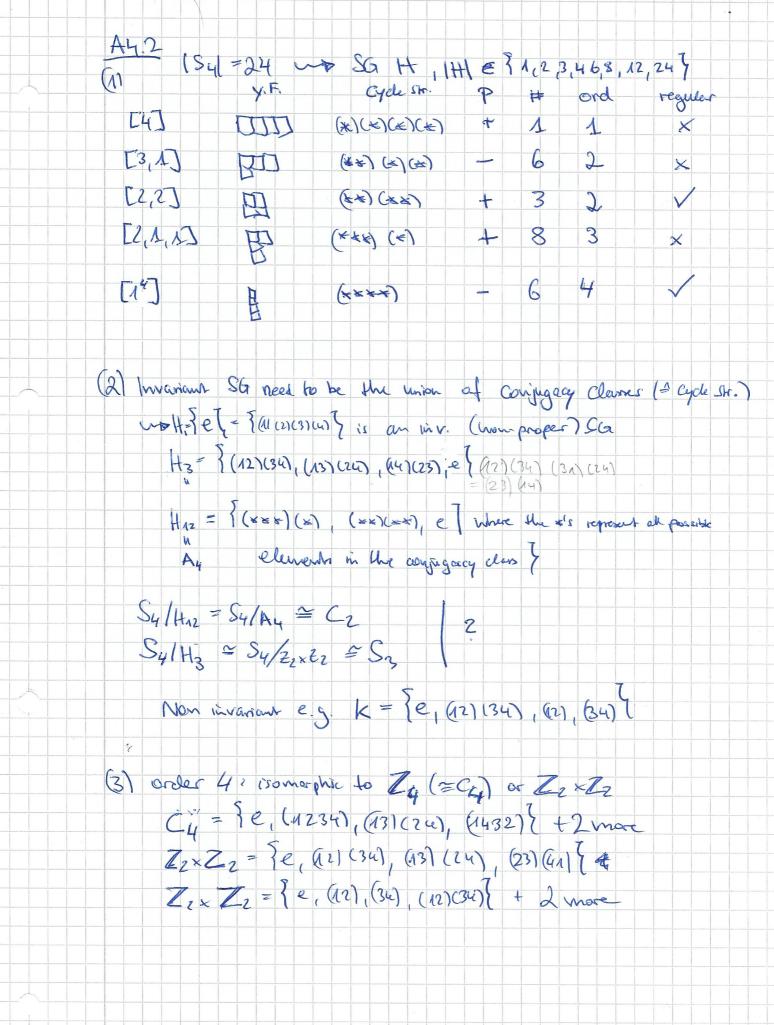
https://www.physics-and-stuff.com/

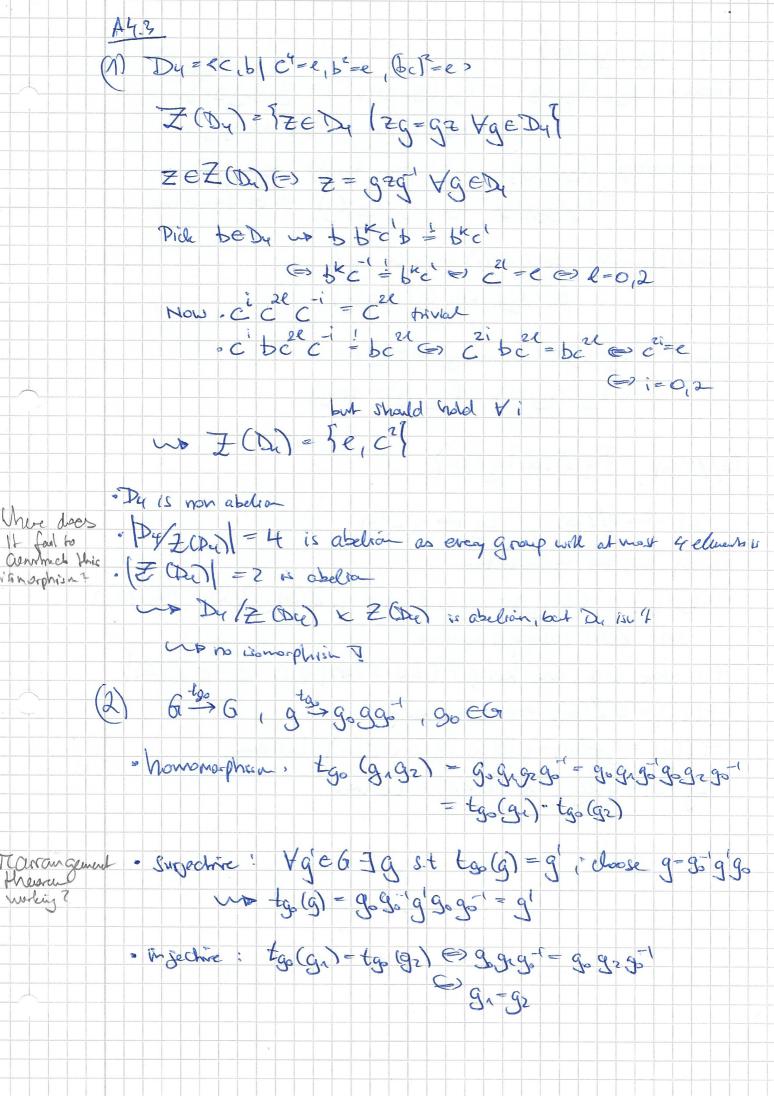
I raise no claim to correctness and completeness of the given solutions! This equally applies to the corrections mentioned above.

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To show injectivity, we will consider Kerf = {qe /ty/faj =1/ the newral element in Pty is (a) Ty = (0,11) (a,11) Ty become (O, M) Ty . (a, M) = (a, M) (a, M) ty = (a, M) ty f ((0, A) tie) = A by commetric and f ((a, N) ti) = f (6, N), Ti) = M but f(Q, NTy) = 1 +1 and thus Kerf = { 6, 12/4 } & 12/4 } Furthermore, we have to show that the mapping is a homomorphica. (((an; n) (az, n) () = f ((a, + n, az, n, n) tu) = n, n2 = f (an nity) f (laz, no) ty) (5) P is not semishaple (no abolion inv. SGI), as Ty is an Offer in St. invariant SG, which diviously is abeau





I(61) = Itas | go ca? · Closure (tg. + tg. (g) = tg. (g, gg;) = g, g, g; g; = ts,92(g) & I(G) as 9,92 & G - associativity, (tg. + tg) tg; (g) = tg,q tg; (g) = tg,g;(g) = tg,(g,g) (3) = tg, o (tg, o tg) (g) os 61 associative - newhood clement: te EI (a) as EE a and te = tglg= te.g.(g) = tg(g) · invoise i to (g) et (a) as ge Grangica as to tg (g) = tg, (g) - te (g) G/Z(6) = 3 9 7 (6) 1 9 6 6 7 I (a) + 6/2(a) , tg + 9 Z (a) obviously surjective by communication 9 (tg, tg2) = 9 (tg,g2) = g,g2 Z(G) = g, Z(G) g,Z(G) = Pltg.) + (tg2) as Z(G) (always) invariant 4 is also 1:1, as kerq=? iE I (9) | P(1) = e = e Z(6)} -f(te) = e Z(G) vo te & kerp P(tg) = 92(Gi) = e7(Gi) iff q e2(Ge) but them, Iff i NOT Possible tg (k) = gkg = k = eke = te (k) o therwise ?