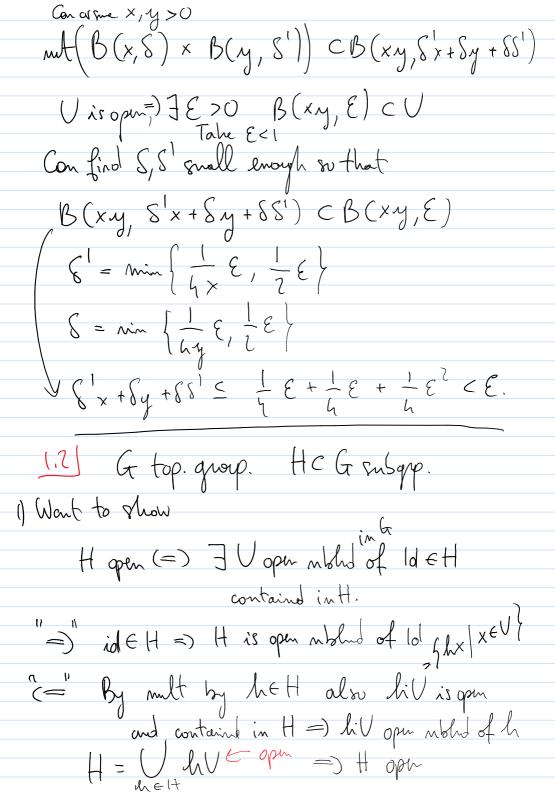
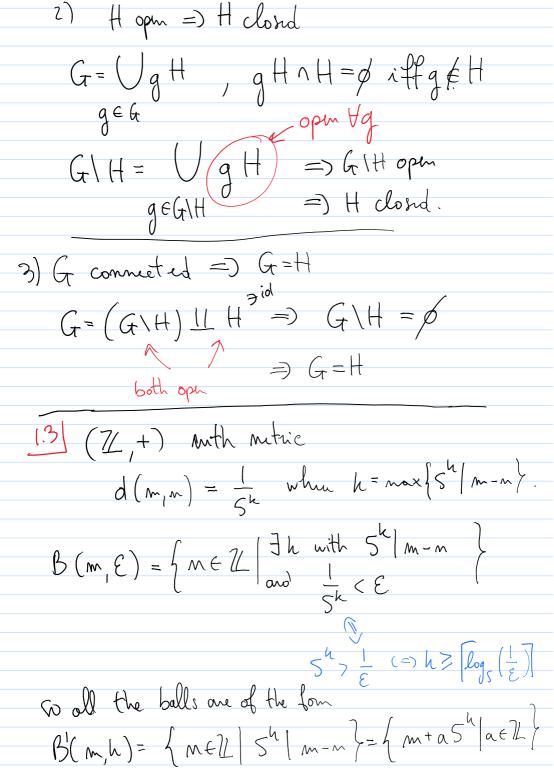
iniducible = no subripresuitantions Completely reducible = direct sm of imdusible repre. (04 and R are the only 51-stable subspace) SICRZ (R*, ·) it is clear a group. We want to show that mult and inv inv:(x) =x-1 ~> this is a continuous mp. mutt (x,y) = xy. Want to show that preinage of a open is open U C IR × open U (xy) ∈ mult (U). We mid to find an open mbhd

of (x,y) in $\operatorname{mult}^1(v)$.





B'(m,h) are a soris of the topology. inv is continuous ~~~ (M) = -M $inv^{-1}(\beta'(n_1h)) = \beta'(-n, h)$ mult (m, m) = m+n O open in (7/4), Want to Now that my in (U) is open. (M, m). Since Vopu Th s.t. $B(m+m, L) \subset U$ $\operatorname{mlt}(B(m,h) \times B(n,h)) = \{m+n+aS^{n}+bS^{n}(a,b+2)\}$ {m+ash} x fn+bsh/ B(m+m, 5h) =) mult (U) is open because contains on apr mobile of every point.

1.4 Rep. of SIXSI. Vm, m∈ZL Pm, m: S'xS' → GL, (C) gm, n(2,2') = 2 m (2') Weed to show that it is a grp. hom. Y7,7', ₹,7' € 5' $g_{m,n}(\overline{z},\overline{z}')g_{m,n}(\overline{z},\overline{z}') = g_{m,n}(\overline{z},\overline{z}',\overline{z}')$ $\mathcal{F}^{(1)}(\mathcal{F}^{(2)}) = (\mathcal{F}^{(2)}) = (\mathcal{F}^{(2$ 2) $p_{m,n} \cong p_{m',n'} = 3 + C \cong C$ $+ (v) = \lambda v \quad \forall \lambda \in C$ S.t. $\forall z, z' \in S^1 \ \forall v \in C$ we have Pm', n' (7,71) f(v) = f(pm, (7,71)v) Take 7=1 =) m=m $P_{m,m} \stackrel{\sim}{=} P_{m,m} =) m = m$ 1=1=) m = m

3) I should have said continuous representation $S \longrightarrow S \times S \xrightarrow{p} GL_{r}(\mathbb{C})$ $z \rightarrow (z, l) \rightarrow \rho(z, l)$ of s'xs' => ris a cont. rup of 5 =) 3 mes.t. p(2,1) = 7 m $S' \rightarrow S' \times S' \rightarrow GL_1(C)$ $2 \mapsto (1,7)$ =) $\exists m \in \mathbb{Z} \text{ s.t. } p(1,7) = 7$. $p(z_1, z_1) = p(z_1) p(z_2) = z_1 (z_2)$ P= Pm, n for rone m, n∈Z With the same proof we can also dwify representations of (S') over C, the C $\frac{2}{5}$ $\frac{2}{5}$ This will tun out to be inportant! We can understand representations of lie groups by looking what hopens

on a noxinal tous.

For example, when studying rep of $SL_n(\mathbb{C})$ we can restrict to what happens on the maximal tous $T^{\infty}(S^1)$ of aligned matrices by entries in S^1 .