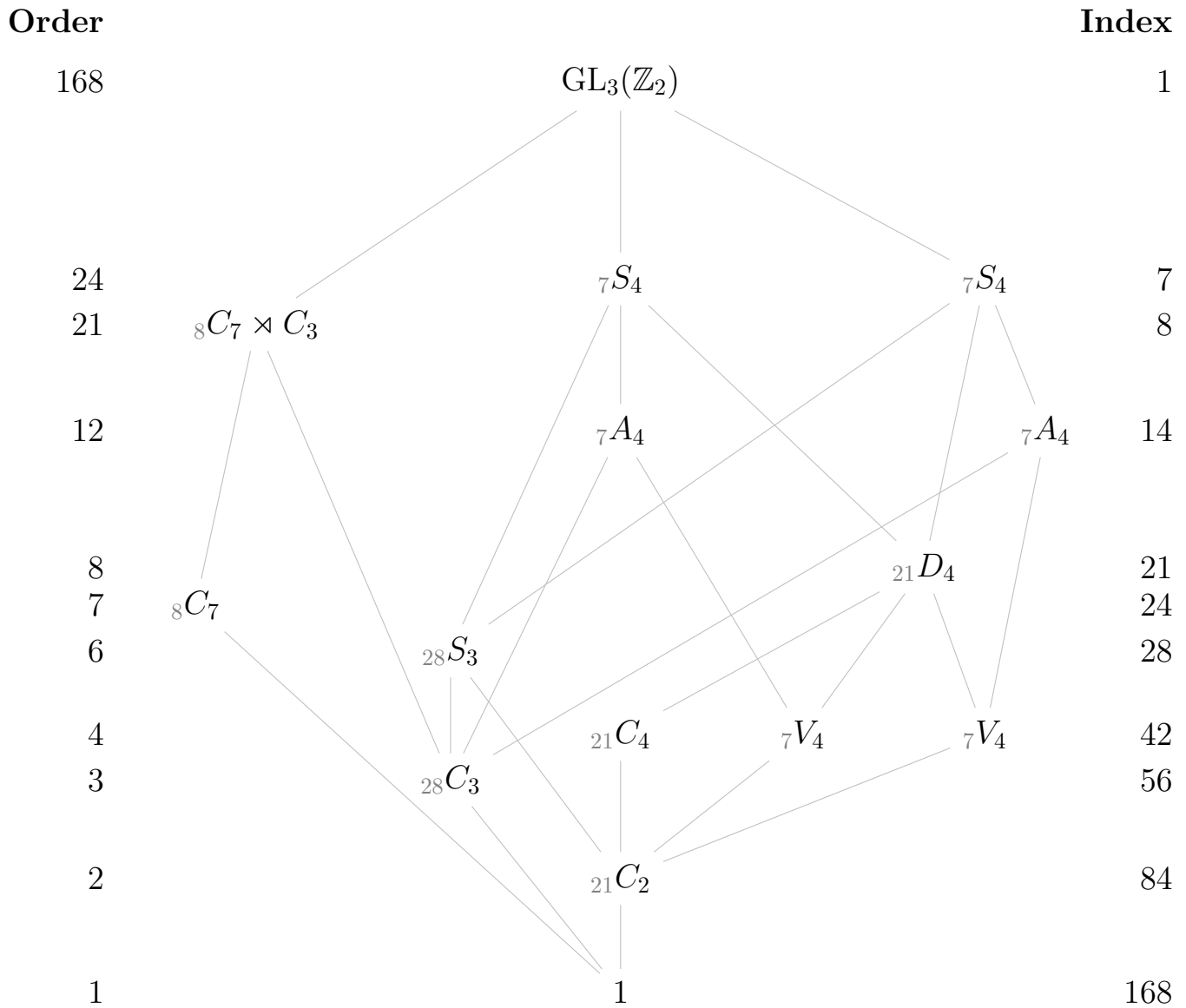


Scratch paper for Math 8510, HW 5

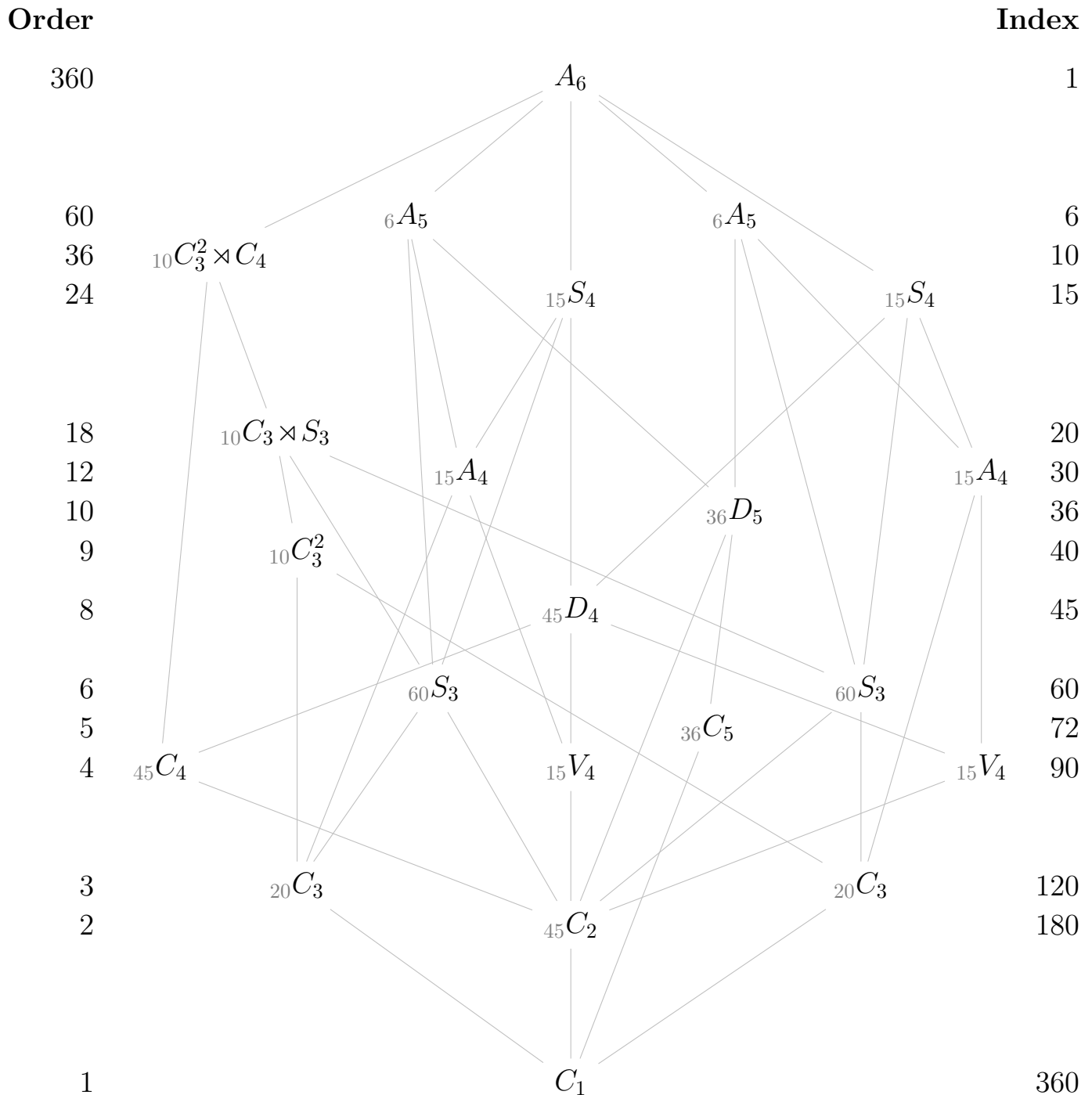
#2(a): The subgroup lattice of the general linear group $GL_3(\mathbb{Z}_2)$, with:

- (i) the p -subgroups color-coded,
- (ii) arrows from each non-singleton conjugacy class $\text{cl}(H)$ to the class $\text{cl}(N(H))$ of its normalizer.



#3(a,b): The subgroup lattice of the alternating group A_6 , with:

- (i) the p -subgroups color-coded,
- (ii) arrows from each non-singleton conjugacy class $\text{cl}(H)$ to the class $\text{cl}(N(H))$ of its normalizer.



#3(c): The ten subgroups of order $90 = 2 \cdot 3^2 \cdot 5$, the number of their subgroups, Sylow p -subgroups, and the isomorphism type of their Sylow 3-subgroup(s).

	#subgroups	n_2	n_3	P_3	n_5
C_{90}					
$C_{30} \times C_3$					
D_{45}					
$C_{15} \times D_3$					
$C_{15} \rtimes D_3$					
$C_9 \rtimes D_5$					
$C_3^2 \times D_5$					
$C_5 \rtimes D_9$					
$C_3 \times D_{15}$					
$C_3 \rtimes D_{15}$					