1 Fundamental Theorem of Galois Theory II

Theorem 1.1. *1. Let $L : K$ be a Galois extension with $G = \mathrm{Gal}_K L$. Then*

$$\forall P \in \mathcal{I}(K, L), \quad L^{G_P} = P$$
$$\forall H \in \mathcal{S}(G), \quad G_{L^H} = H.$$

Also, $P_1 \subseteq P_2 \iff G_{P_1} \geq G_{P_2}$ and $H_1 \leq H_2 \iff L^{H_1} \supseteq L^{H_2}$ (by thm 1 lec 19)

2. For $P \in I(K, L)$ suppose $P : K$ is a normal extension. Then $G_P \triangleleft G$ and $\mathrm{Gal}_K P \cong G/G_P$.

Lemma 1.2. *Let $K - P - L$ be a tower of fields and $g \in \mathrm{Aut}\, L$. Then $G_{gP} = gG_Pg^{-1}$.*