Q2: Let $G = D_8, K = \{e, \sigma\rho, \sigma\rho, \rho^2\}, H = \{e, \sigma\rho\}$. We claim that $H \triangleleft K \triangleleft G$. Since $[G : K] = 2$ we have that $K \triangleleft G$. Note that as well $[K : H] = 2$, so $K \triangleleft H$. We claim that $H$ is not normal in $G$. We have that

$$\sigma H = \{\sigma, \rho\}$$

and

$$H\sigma = \{\sigma, \rho^3\}.$$

We have the desired result.