Reading Questions 12

page 69: Definition 2.79

1. Let A and B be groups. Then $AB = \{ab|a \in A, b \in B\}$.
2. Let A and B be subgroups of G. Then $AB \subseteq G$.
3. Let $A =< 2 >, B =< 3 >$ and $G = Z_6$. Write the elements of BA.

Section 2.6 Subgroups (Part 2)

special subgroups

P 1. Let $X = \{(R_0, R_{180})\}$ and $G = D_8 \times D_8$. Find $C_G(X)$.

P 2. Let G be a group such that $H, K \leq G$. Prove $H \cap K \leq G$.

P 3. Let G and H be groups, and let $\phi : G \to H$ be a homomorphism. The set $\{x \in G \mid \phi(x) = e\}$ is called the kernel of ϕ and is denoted by $\ker(\phi)$. Prove $\ker(\phi) \leq G$.

P 4. Let G be a group, let $H \leq G$ and let $x \in G$. Prove $\{xhx^{-1} \mid h \in H\} \leq G$.