Chapter 5

1.) a.) $\alpha^{-1} = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 1 & 3 & 5 & 4 & 6 \end{bmatrix}$

b.) $\beta\alpha = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 1 & 6 & 2 & 3 & 4 & 5 \end{bmatrix}$

c.) $\alpha\beta = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 6 & 2 & 1 & 5 & 3 & 4 \end{bmatrix}$

3.) a.) $(1235)(413) = (15)(234)$

b.) $(13256)(23)(45612) = (124635)$

c.) $(12)(13)(23)(142) = (1423)$

5.) The order of a permutation is given by the least common multiple of the lengths of its disjoint cycles.

a.) $|(124)(357)| = \text{lcm}(3,3) = 3$

a.) $|(124)(3567)| = \text{lcm}(3,4) = 12$

c.) $|(124)(35)| = \text{lcm}(3,2) = 6$

d.) $|(124)(357869)| = \text{lcm}(3,6) = 6$

e.) $|(1235)(24567)| = \text{lcm}(4,5) = 20$

f.) $|(345)(245)| = \text{lcm}(3,3) = 3$

Chapter 6

1.) awd

6.) Let G, H, and K be groups.