

4.1.10 G 8-regular.

(1) G 8-regular.

Let G be a graph.

$$G = \{v_1, v_i, v_j, v_k\}$$

$$i^2 = j^2 = k^2 = -1$$

$$ij = -ji = k, jk = -kj = i, ki = -ik = j$$

4.1.27 Let $C(x)$ be the set of elements

$$C(x) = \{y \in G \mid y = gxg^{-1}, g \in G\}$$

$$C(1) = \{1\}$$

$$C(-1) = \{-1\}$$

$$C(v_i) = \{v_i, v_j, v_k\}$$

$$C(v_j) = \{v_j, v_i, v_k\}$$

$$C(v_k) = \{v_k, v_i, v_j\}$$

Therefore $C(1), C(-1), C(v_i), C(v_j), C(v_k)$ are

(2) $1, -1, v_i, v_j, v_k$ form a basis for G .

4.1.26 (2) Let G be a group and H be a subgroup.

$$Z_G(H) = \{g \in G \mid hg = gh, \forall h \in H\}$$

Let G be a group and H be a subgroup.

$$H_1 = \{1\}$$

$$H_i = \{1, i, -1, -i\}$$

$$Z_G(H_1) = G \text{ and } C(1) = \{1\}$$

$$|C(1)| = 1 = |G|/|Z_G(H_1)| = 8/8$$

$$Z_G(H_i) = \{v_1, v_i\}$$

$$C(1) = \{1\}$$

$$C(-1) = \{-1\}$$

$$C(v_i) = \{v_i, v_j, v_k\}$$

$$C(v_j) = \{v_j, v_i, v_k\}$$

$$|C(i)| = 2 = |G|/|Z_G(H_i)| = 8/4$$