### **Integrality Properties**

	1	$k_2$	• • •	k <sub>r</sub>
G	1	<i>g</i> <sub>2</sub>	• • • •	g <sub>r</sub>
$\chi_1$	1	1	• • •	1
$\chi_2$	$d_2$	$\chi_2(g_2)$	• • •	$\chi_2(g_r)$
÷	÷	•	·	:
$\chi_r$	$d_r$	$\chi_r(g_2)$		$\chi_r(g_r)$

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Let  $K_G(g_j)$  be the conjugacy class of  $g_j$ , and let  $\kappa_j = \sum_{g \in K_G(g_j)} g \in \mathbb{C}[G]$  be the class sum associated to  $g_j$ .

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If  $\mathbb{C}[G] \cong n_1 S_1 \oplus \cdots \oplus n_r S_r$ , then the left-multiplication action of  $\kappa_j$  on  $S_i$  has matrix  $\lambda_i I_{n_i}$ 

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**Summary.**  $k_j \cdot \chi_i(g_j)/\chi_i(1)$  is an algebraic integer for any *i*, *j*.

**Corollary.** If  $gcd(k_j, \chi_i(1)) = d$ , then  $\left(\frac{d}{\chi_i(1)}\right) \chi_i(g_j)$  is an algebraic integer.

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Proof.

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