

Report for
Diagonalizations of Circulant Matrices and
Analogous Reductions for Group Matrices
by Roger Chalkey

In this article the author carefully and constructively tells the story of circulant matrices and extensions to group matrices. The author builds on the basic theory of circulant matrices and discusses the analogous results in the more general setting of group matrices. He then goes on to make further connections to the classes of a given groups and characters associated with abelian groups. It is a well-written, self-contained, and accessible paper. The author, who is clearly an expert in the field, presents a wonderful historical account of this important and well-studied class of matrices, and does so with a seamless flow. He also includes an extensive bibliography for the interested reader. He has very carefully organized the paper so that it will be of interest to non-specialists yet, it will still be useful and enjoyable for experts. He makes good use of illustrative examples and existing references to engage the reader.

The article is lengthy, but it is not overbearing. Moreover, it is not clear that any particular section can be shortened or even omitted, without sacrificing clarity of exposition.

This seems to be an easy call for me, as the author has gone to great lengths to ensure this comprehensive review is polished, complete, and appealing to a wide audience. In my opinion the mathematics presented is correct, and this article is certainly suitable for publication in the American Mathematical Monthly. Finally, I have only a couple of very minor suggestions.

Minor Comments:

- pg.9 l.-4: delete "of ours"
- pg.14 l.1: the letter "j" should be in italics
- pg.28 l.3: should be ... = $[\det(R_3(g_i))]$