(iii) *There is no sequence* $P_{i_1}, \cdots, P_{i_k} \ni P_{i_k} = P_{i_1}$, *and* $W_{P_{ij}} \cap W^*_{P_{ij+1}} \neq \emptyset$ *for* $1 \leqq j \leqq k-1$.

Let a^i_j be the number of P's whose stable manifold is of dimension $i+j$. Then the numbers

$$M_q = \sum_{k=0}^{n} \sum_{i=0}^{k} \binom{k}{i} a^k_{q+i} \text{ and } R_q = \dim H^q(M; F),$$

satisfy the Morse inequalities.

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COHOMOLOGY OF CYCLIC GROUPS OF PRIME SQUARE ORDER

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1. **Introduction.** Let G be a cyclic group of order p^2, p a prime, and let U be its unique proper subgroup. If A is any G-module, then the four cohomology groups

$$H^0(G, A) \quad H^1(G, A) \quad H^0(U, A) \quad H^1(U, A)$$

determine all the cohomology groups of A with respect to G and to U. We have determined what values this ordered set of four groups takes on as A runs through all finitely generated G-modules.

2. **Methods of proof.** First we show that every finitely generated G-module has the same cohomology as some finitely generated R-torsion free RG-module, where R is the ring of p-adic integers. Be-

cause the cohomology of a direct sum is the direct sum of the cohomologies, we can construct the cohomology of any module from that of the indecomposable modules. A. Heller and I. Reiner have shown that any finitely generated R-torsion free indecomposable RG-module is one of four standard modules or is imbedded in one of five exact sequences [**2**]. We compute directly the cohomology of the standard modules; the exact sequences give rise to cohomological exact sequences from which we obtain certain restrictions on the cohomology. The remaining uncertainty is resolved by computations based on the notion of R-enlargements [**1**] applied to the five exact sequences.

3. **Results.** The cohomology of any finitely generated G-module is a direct sum of finitely many of the following:

	$H^0(G, A)$	$H^1(G, A)$	$H^0(U, A)$	$H^1(U, A)$
1.	Z_{p^2}	0	Z_p	0
2.	0	Z_{p^2}	0	Z_p
3.	Z_p	0	pZ_p	0
4.	0	Z_p	0	pZ_p
5.	Z_p	0	0	$(p-1)Z_p$
6.	0	Z_p	$(p-1)Z_p$	0
7.	Z_p	Z_p	nZ_p	$nZ_p,\ n=1, \cdots, p$
8.	$2Z_p$	0	$(n+1)Z_p$	$nZ_p,\ n=1, \cdots, p-1$
9.	0	$2Z_p$	nZ_p	$(n+1)Z_p,\ n=1, \cdots, p-1.$

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