CORRECTION 2.*

Replace
pages 1.7 – 1.10A (with all inserts) with the following:

with the cases that are easiest to describe:

THEOREM 7. Let p be an odd prime, let $n \geq 3$, and let M^{2n-1} be a fake lens space with fundamental group $\mathbb{Z}_p$. Assume further that $n \not\equiv 0 \mod p-1$. Then the quotients

$$\Theta_k([M, G/Top]) / \Theta_{k-1}([M, G/Top]) \quad \cdots$$

$$\Theta_{2j+2}([M, G/Top]) / \Theta_{2j}([M, G/Top])$$

are given as follows:

(i) $\Theta_{k+1}/\Theta_k = 0$ if $k \geq 2\left[\frac{n}{p-1}\right] + 2$ where $[\,\text{–}\,]$ denotes the greatest integer function.

(ii) If $k = 2j$ and $1 \leq j \leq \left[\frac{n}{p-1}\right]$ then $\Theta_{2j+2}/\Theta_{2j} \cong \mathbb{Z}_p$, where $\Theta_2 = 0$ by definition.

(iii) If $2 \leq j \leq \left[\frac{n}{p-1}\right]$, then either

$\theta_{2j+1} = \theta_{2j}$ or $\theta_{2j+1} = \theta_{2j+2}$. ~~but not both~~

There is a similar but slightly weaker conclusion when $n \equiv 0 \bmod p-1$.

THEOREM 8. *Suppose we are in the same setting as in Theorem 7 but $n \equiv 0 \bmod p-1$. Then (i) and (iii) remain valid. However, if $k = 2j$ and $1 \leq j \leq \left[\frac{n}{p-1}\right]$, then $\theta_{2j+2}/\theta_{2j} \cong \mathbb{Z}_p$ except for a single value j_0 of j.*

We shall say more about the exceptional value in Section 7; unfortunately, our methods only yield limited information about the exceptional value j_0, but we shall provide some evidence for conjecturing that $j_0 = 1$ in all cases.

Here is more qualitative consequence of the preceding two results:

COROLLARY 9. Let L^{2n-1} be a lens space with $n \geq 3$.

(i) If $n \not\equiv 0 \bmod p-1$, then for each j such that $1 \leq j \leq [\frac{n}{p-1}]$, then there exist manifolds L_j tangentially homotopy equivalent to L such that $L_j \times \mathbb{R}^{2j}$ and $L \times \mathbb{R}^{2j}$ are not homeomorphic but $L_j \times \mathbb{R}^{2j+2}$ and $L \times \mathbb{R}^{2j+2}$ are homeomorphic.

(ii) If $n \equiv 0 \bmod p-1$, then the same conclusion holds for all but one value of j such that $1 \leq j \leq \left[\frac{n}{p-1}\right]$.

(iii) If N is a fake lens space which is tangentially homotopy equivalent to L and $k \geq 2\left[\frac{n}{p-1}\right]+2$, then $L \times \mathbb{R}^k$ and $N \times \mathbb{R}^k$ are homeomorphic.

PROCEED TO 11, OMITTING THE RED COMMENTS ON THAT PAGE