

PRINT Your Name: _____

Quiz for April 8, 2010

The quiz is worth 5 points. **Remove EVERYTHING from your desk except this quiz and a pen or pencil.**

Compute the factor group

$$\frac{\frac{\mathbb{Z}}{6\mathbb{Z}} \times \frac{\mathbb{Z}}{4\mathbb{Z}}}{\langle (2 + 6\mathbb{Z}, 2 + 4\mathbb{Z}) \rangle}.$$

ANSWER:

Let $G = \frac{\mathbb{Z}}{6\mathbb{Z}} \times \frac{\mathbb{Z}}{4\mathbb{Z}}$ and N be the subgroup $\langle (2 + 6\mathbb{Z}, 2 + 4\mathbb{Z}) \rangle$. We see that G has 24 elements and N has 6 elements; so G/N has 4 elements and they are

$$(0,0) + N, \quad (1,0) + N, \quad (0,1) + N, \quad (1,1) + N.$$

We see that

$$2(0,0), \quad 2(1,0), \quad 2(0,1), \quad 2(1,1)$$

are all on N ; so “each element of G/N squares to the identity element” and G/N is the Klein four-group.