Math 360
Section 2.4 Exercises

Trevor Klar

July 23, 2018

1.
$$\mathbb{Z}_2 \times \mathbb{Z}_4 = \left\{ \begin{array}{ll} (0,0) & \text{order } 1 \\ (0,1) & \text{order } 4 \\ (0,2) & \text{order } 2 \\ (0,3) & \text{order } 4 \\ (1,0) & \text{order } 2 \\ (1,1) & \text{order } 4 \\ (1,2) & \text{order } 2 \\ (1,3) & \text{order } 4 \end{array} \right\}.$$

Thus, the group is not cyclic since none of the elements are of sufficient order to generate the group (order 8).

3. $(2,6)$ in $\mathbb{Z}_4 \times \mathbb{Z}_{12}$ is of order $\text{lcm}(2,2) = 2$.

4. $(2,3)$ in $\mathbb{Z}_6 \times \mathbb{Z}_{15}$ is of order $\text{lcm}(2,2) = 2$.