

## Lesson 7

### CYCLE GRAPHS – PRACTICE

There are five distinct, non-isomorphic groups of order 8. We've already seen the cycle graph for one of them, the quaternion group  $Q$ . Now we'll find the cycle graphs for the remaining four.

1. Find a generator diagram and the cycle graph for  $C_8 = \{ (), (1,2,3,4,5,6,7,8), (1,3,5,7)(2,4,6,8), (1,4,7,2,5,8,3,6), (1,5)(2,6)(3,7)(4,8), (1,6,3,8,5,2,7,4), (1,7,5,3)(2,8,6,4), (1,8,7,6,5,4,3,2) \}$
2. Find a generator diagram and the cycle graph for  $D_4 = \{ (), (2,4), (1,2)(3,4), (1,2,3,4), (1,3), (1,3)(2,4), (1,4,3,2), (1,4)(2,3) \}$
3. Find a generator diagram and the cycle graph for  $C_2 \times C_4 = \{ (), (3,4,5,6), (3,5)(4,6), (3,6,5,4), (1,2), (1,2)(3,4,5,6), (1,2)(3,5)(4,6), (1,2)(3,6,5,4) \}$
4. Find a generator diagram and the cycle graph for  $C_2 \times C_2 \times C_2 = \{ (), (5,6), (3,4), (3,4)(5,6), (1,2), (1,2)(5,6), (1,2)(3,4), (1,2)(3,4)(5,6) \}$