

## Day 5: Symmetries

1. Whiteboard page 1.
  - **Demonstration:** Show  $r_{90}$  and some non-examples (e.g., translation,  $r_{45}$ ).
  - After “Discuss in your group,” talk about how  $r_{450} = r_{90}$ .
2. Whiteboard pages 2 through 4.
3. **Work on Day 5 Class Work. Leave 10 – 12 minutes for discussions.**
4. Whiteboard page 4.
  - Fill in  $r_{90} \circ d = h$  and discuss how  $D_4$  is *not* commutative.
5. Whiteboard pages 5 through 7.

**Proof of the Day:** Shown in video only.

**Theorem 5.13.** *Fix  $\tau \in D_4$ . If  $\alpha \in C(\tau)$  and  $\beta$  is the inverse of  $\alpha$ , then  $\beta \in C(\tau)$ .*