1. Draw the graph of \( f(x) = 1 - |x| \) for \( x \) on \([-1, 1]\). Now draw a figure that explains \( f(x) = 1 - |x| \) without drawing a graph, as you saw done for \( f(x) = |x| \). It’s easier if you look at \( f(x) \) on \([-1, 0]\) and on \([0, 1]\) separately.

2. Find the fixed points of \( f(x) = x^3 \). Draw the graph and locate the fixed points. What happens if you also draw the graph of \( g(x) = x \) on the same figure?

3. Use Bolzano’s Intermediate Value Theorem to prove that the equation \( \sqrt{x + 1} + \sqrt{x + 2} = 2 \) has a solution on \([-1, 1]\).

4. Describe how \( f(z) = z^2 \) behaves on the unit disc \( D \). What are its fixed points?

5. The complex conjugate of \( z = x + yi \) is \( \bar{z} = x - yi \). Describe \( f(z) = \bar{z} \) on \( D \) and find its fixed points.

6. Draw a figure to show how \( f(z) = z^3 \) behaves on the unit circle \( C \). There are two fixed points; can you find them? How many fixed points does \( f(z) = z^4 \) have on \( C \). Can you find the pattern for the number of fixed points of \( f(z) = z^k \) on \( C \)?

7. Describe a smooth map of \( D \) such that \( f(z) = \bar{z} \) on \( C \) that has no fixed points except on \( C \).

8. Define a map of \( D \) such that \( f(z) = z^3 \) on \( C \) that has no fixed point points except on \( C \). (Hint: Recall Schirmer’s construction for \( f(z) = z^2 \)).