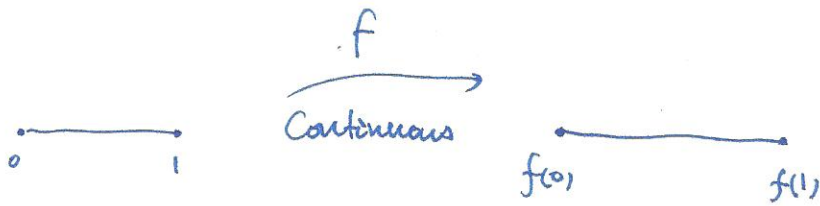


Solution to the fixed point problem (from Lesson 8)

We may assume that we are stretching a line segment of length 1:



Since f is stretching, we can further assume that

$$f(0) < 0 \quad \text{and} \quad f(1) > 1.$$

Define $g(x) = f(x) - x$ and observe that

$$g(0) = f(0) < 0 \quad \text{and}$$

$$g(1) = f(1) - 1 > 0.$$

By the intermediate value theorem there exists $c \in [0, 1]$ such that

$$0 = g(c) = f(c) - c, \quad \text{in which case} \quad f(c) = c.$$