



$$f: X \rightarrow Y \quad x_0 \in X \quad y_0 = f(x_0) \in Y$$

$$\exists g: Y \rightarrow X \quad \text{t.c.}$$

$$g \circ f \simeq 1_X \quad f \circ g \simeq 1_Y$$

$$\omega: ([0, 1], \{0, 1\}) \rightarrow (X, x_0)$$

$$f \circ \omega: ([0, 1], \{0, 1\}) \rightarrow (Y, y_0)$$

$$g \circ f \circ \omega: ([0, 1], \{0, 1\}) \rightarrow (X, x_0)$$

$$g \circ f \circ \omega \simeq 1_X \circ \omega = \omega$$

$$g \# f \# ([\omega]) = [g \circ f \circ \omega] = [\omega]$$

