Exercise 1. Every identity arrow is iso.

Proof. Let $\mathbf{1}_a$ be the identity arrow for an object a. The identity laws applied to arrows $f, g \colon a \to a$ give:

$$\mathbf{1}_a \circ f = \mathbf{1}_a \quad g \circ \mathbf{1}_a = \mathbf{1}_a$$

Setting $g = \mathbf{1}_a$ in the first equality and $f = \mathbf{1}_a$ in the second yields

$$g \circ f = \mathbf{1}_a \quad g \circ f = \mathbf{1}_a$$

which is the definition of f and g being iso from a to a. Since $f = g = \mathbf{1}_a$, we conclude that $\mathbf{1}_a$ is iso.

□