My hint for Exercise F.3 is not correct. Instead, let us define the binary relation \( \oplus \) on \((0, 1)\) by

\[
x \oplus y := f^{-1}(f(x) + f(y))
\]

where \( f \) is some invertible real map on \((0, 1)\) such that \( f(x) + f(1 - x) = 0 \) for each \( x \) in \((0, 1)\). It is not difficult to check that \( ((0, 1), \oplus) \) is an Abelian group (whose additive identity is \( \frac{1}{2} \)) such that the inverse of \( x \) is \( 1 - x \) for each \( x \) in \((0, 1)\). It remains to pick an \( f \) with the desired properties. There are many choices in this regard. Here is one:

\[
f(x) := \begin{cases} 
2 - \frac{1}{x}, & \text{if } 0 < x \leq \frac{1}{2} \\
\frac{1}{1-x} - 2, & \text{otherwise.}
\end{cases}
\]

(This solution is communicated to me by Kuntal Banerjee.)