Problem 18: Consider the mapping of

$$f : G \times G \to G$$

given by $f(g, h) = g \cdot h^{-1}$, and then construct and examine an open set $V \times V$ such that

$$(identity, identity) \in V \times V \subset f^{-1}(U).$$

Problem 19: Think about what kind of open set you want and use the ideas in 18 to construct it. (There are two path to the solution one is easy , and one requires considering the mapping produced by fixing an element $x \in G$ and letting $f(g, h) = x \cdot g \cdot h^{-1} \cdot x^{-1}$ and the applying the same ideas as found in the previous problem.)

Problem 20: Think about problem 19.