Family of uniform hash functions

The notion of pairwise independence says that, for any $x1 \neq x2$ and $c1, c2 \in Z_p$, we have that

$$Pr_{h \in H}[h(x1) = c1 \wedge h(x2) = c2] = Pr_{h \in H}[h(x1) = c1] * Pr_{h \in H}[h(x2) = c2]$$

In other words, the joint probability is the product of the two individual probabilities. Show that the family of hash functions $H = \{h_{ab}(x) = ((ax + b) \; mod \, p) \; mod \, m \;\; : a \in Z_p^*, b \in Z_p\}$ (seen in class) is "pairwise independent", where p is a sufficiently large prime number $(m + 1 \leq p \leq 2m)$.

SOLUTION