A ring R is called a Boolean ring if $a^{2}=a for all a\in R. Let R=P\left(X\right)be the power set of X. $Define addition and multiplication in R as follows:

$$a+b=(a∩b^{'})∪(a^{'}∩b)$$

$$a×b=a∩b$$

Show that (R,+,\*) is a Boolean ring.