a) Let $r \in R$, a Boolean ring with unity.

We know $(-r) \cdot r = r^2 = r$. Also, $(-r)^2 = -r$, so $r = -r$. Then $2r = 0$.

b) Let $r, s \in R$. Consider $r^2 + s^2 = r + s = (r + s)^2$.

$= (r + s)(r + s) = r^2 + sr + rs + s^2$. Since $r^2 + s^2 = r^2 + sr + rs + s^2$, we know $sr + rs = 0$ and $sr = -rs$. But from (a), every $r \in R$, $r = -r$. So $sr = rs$. 