UH Math 3330-01 Dr.Heier-Spring 2017
HW11 Key

Yan He

(1)Sufficient to prove $(-1)a + a = 0$. In fact, by distributive law $(-1)a + a = [(-1) + 1]a = 0a = 0$.

(2)(a) Direct computation.

(b)$r(1 - r) = 0$

(3)(a)$r + r = (r + r)^2 = r^2 + r^2 + r^2 + r^2 = r + r + r + r \implies r + r = 0$.
(b)$(r+s)(r+s) = (r+s) \implies r^2+sr+rs+s^2 = r+s \implies r+s+sr+rs+s = r + s \implies sr = rs$.

(4)$b = b1 = bab$ Since b is not a zero divisor, $1 = ba$ by canceling b both sides.

(5)By showing
(i)F is a commutative subring with identity.
(ii)Every non-zero matrix in F is invertible(determinant $a^2 + b^2$), and inverse still in F.