1) Use the field axioms to prove the following results (for all x, y, z in a field F), and give the label (on p. 5) for each axiom that you are using:
   a) \( x(y+z) = xy+xz \)
   b) If \( xy=0 \), then \( x=0 \) or \( y=0 \).
   c) If \( xz=yz \) and \( z\neq 0 \), then \( x=y \).
   d) \( (-x)y = -xy \)
   e) \( x0=0 \)

2) If \( x \) and \( y \) are in \( R \), show that \( \max\{x,y\} = \frac{1}{2} [ x+y+|x-y| ] \), and find a similar formula for \( \min\{x,y\} \).

3) Show that if \( E \) is a nonempty set of integers which is bounded above, then \( \max E \) exists.

4) Use the axioms for an ordered field to prove the following results, and give the label (on p. 5 or p. 7) for each axiom that you are using:
   a) \( x^2 > 0 \) for \( x \neq 0 \)
   b) \( 1 > 0 \)
   c) If \( x > 1 \), then \( 0 < x^{-1} < 1 \).

5) (In this problem, assume that we have not yet defined roots for real numbers.)
   Let \( E = \{x \text{ in } R : x^2 < 3\} \). Show that \( s = \sup E \) exists, and that \( s^2 = 3 \).

6) Define an order relation on \( C \) by \( a+bi < c+di \) iff \( a < c \), or \( a=c \) and \( b < d \).
   For each of the order axioms, prove or disprove that \( C \) with this relation satisfies the axiom.