

Homework for October 16

Let $S = \{p, q, r\}$ be a set, and suppose that we have operations of addition and multiplication on S given by the following tables.

$+$	p	q	r
p	p	q	r
q	q	r	p
r	r	p	q

\cdot	p	q	r
p	p	p	p
q	p	q	r
r	p	r	q

I claim that this makes S into a field, according to the axioms on the field worksheet.

1. Which element of S is 0?
2. Which element of S is 1?
3. Which element of S is $-q$?
4. Which element of S is r^{-1} ? [Unless your 0 is r ...]

For each of these, give your answer and a one sentence explanation about why you think it is the right answer.