I will complete the proof of the fact that the rule given in #1(d) on p. 46 <u>is</u> an operation on $G = \mathbb{Q} - \{-1\}$ (and, therefore, G <u>is</u> a group - Since we checked all other needed properties of $*$ in class). I need to check that the rule $a * b = a + b + ab$ applied to rational numbers gives -1 only if one of a or b is -1.

This will show that when neither a nor b is -1 then $a * b \neq -1$.

So suppose $a + b + ab = -1$ then solving for b in terms of a: $b(1+a) = -1 - a = -(1+a)$.

When $a \neq -1$ we can divide: $b = -\frac{1+a}{1+a} = -1$.

That's a contradiction.