

Answer on Question #58448 – Math – Abstract Algebra  
Question

Do the non zero positive rational no. form a group w.r.t multiplication?

Solution

- 1) Closure:  $a, b \in \mathbb{R} \setminus \{0\} \Rightarrow a \cdot b \in \mathbb{R} \setminus \{0\}$ ;
- 2) Associativity:  $a, b, c \in \mathbb{R} \setminus \{0\} \Rightarrow (a \cdot b) \cdot c = a \cdot (b \cdot c)$ ;
- 3) Identity element:  $1 \in \mathbb{R} \setminus \{0\}$ ;  $a \cdot 1 = 1 \cdot a = a$ ;
- 4) Inverse element: for each  $a \in \mathbb{R} \setminus \{0\}$  there exists  $a^{-1} = 1/a$  such that  
 $a \cdot a^{-1} = a^{-1} \cdot a = 1$ .

**Answer:** Yes.