

Question #15073 The product of non zero rational and an irrational is irrational. Please explain.

Solution Let α be irrational number and $q = \frac{m}{n}$ be any non-zero rational number $m \neq 0$. Assume that $\alpha \cdot q = r$, where r is some rational number. So, $r = \frac{l}{k}$, thus $\alpha = \frac{ln}{km}$, which contradicts the fact that α is irrational. Hence, $\alpha \cdot q$ is irrational, providing that q is non zero rational.