Answer on Question #52571 – Math - Combinatorics | Number Theory

Show that if $b \mid a$ and $c \mid a$ and $(b,c)=1$ then $bc \mid a$.

Solution

Assume that a,b,c natural numbers.
Since $b \mid a$ then there exists natural k such that $a=bk$. Since $c \mid a$ then there exists natural m such that $a=cm$. Therefore $bk=cm$.
Let's consider the equality $bk=cm$: $bk=cm \Leftrightarrow k=\frac{cm}{b}$. Since k is natural, then $\frac{cm}{b}$ is natural.
Since $(b,c)=1$, then we obtain that $b \mid m$, therefore there exists natural n such that $m=nb$.
Thus, we obtain that $a=cm=cnb=n(bc)$. Since $n \in N$ then $bc \mid a$.