

Problem # 169

Let a and b be positive integers, such that $34a = 43b$. Show that the integer $a + b$ is a composite number.

Solution:

Proof.

The condition $34a = 43b$ implies that there exist integers c and d such that $a = 43c$ and $b = 34d$. Substituting this into the given equation we conclude that $c = d$. It follows that $a + b = (34 + 43)c = 77c$, so $a + b$ is composite.

□

Source: University of Warsaw, Entrance Exam, 2000.