

Problem for 2012 September

Proposed by Dan Jurca

Prove that for each integer n the fraction

$$\frac{39n + 2}{91n + 5}$$

is in lowest terms; *i.e.*, cannot be “reduced”.

Solution by the proposer

Since $-7(39n + 2) + 3(91n + 5) = 1$ the numerator and denominator of the fraction are relatively prime; hence there exists no common divisor (other than ± 1), so the fraction cannot be reduced.

Also solved by Alex Jeon, Maryna Longnickel, Massoud Malek, and John Sayer