

Full Name:

1. Suppose x and y are positive integers. Prove that if 3 divides $x + y$, then 3 divides $10x + y$.

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2. Recall that you proved $(a + bc, b) = (a, b)$ for all integers a, b , and c , in your assignment.

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Now choosing suitable values of a, b , and c in above identity, prove that

$$(x - 4y, y) = (4x + y, x) \text{ for all integers } x \text{ and } y.$$

[HINT: You have to use the identity twice.]

3. Observe that by definition of the greatest integer function, the real numbers t that satisfy $\lfloor t \rfloor = n$ for some $n \in \mathbb{N}$ are given by $t \in [n, n + 1)$.

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Using this fact, solve the following equation for x .

$$\lfloor \lfloor x + 0.3 \rfloor + 0.7 \rfloor = 1$$

4. Consider an Arithmetic Progression whose first term is 4 and the common difference is 3. If the n th term in this AP is 181, find the value of n .

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