Warning

Henceforth, when asked to *symbolically write* a statement, do so **using quanifiers**.

Don't forget needed parentheses, e.g., $a|b-1$ does not make sense and should be written as $a|(b-1)$.

LaTex Help

Def. A nonzero integer m divides an integer n, denoted $m|n$, provided that $(\exists q \in \mathbb{Z})\ [qm = n]$. p82

Remark. The notation for a $m \in \mathbb{Z}^{\neq 0}$ not dividing $n \in \mathbb{Z}$ is $m \nmid n$.

Exercise. A variant of Exercise 3.1.6b. §3.1 p97

Theorem 1. For each integer a, if there exists an integer n such that a divides $9n+5$ and a divides $6n+1$, then a divides 7.

a. Symbolically write Theorem 1. Do not use English words but you can use the divides symbol (e.g., $a|b$).

Hint. Break down Theorem 1 in small steps. Thm 1 says

For each integer a, if there exists an integer n such that $a|(9n+5)$ and $a|(6n+1)$, then $a|7$.

Now add some parenthees/brackets and take note of the if-then ...

$$(\text{For each integer } a)\ \Big[\ \big(\ \text{there exists an } n \in \mathbb{N} \text{ such that } a|(9n+5) \text{ and } a|(6n+1)\ \big)\ \Rightarrow\ a|7\ \Big].$$

Now get rid of the English.

put solution here

b. Prove Theorem 1.