

Warning

Henceforth, when asked to *symbolically write* a statement, unless otherwise stated,

- symbolically write the statement as it is stated (rather than something equivalent)
- if a statement is a quantified open sentence, then use needed quantifier(s) before the open sentence (e.g.: $\forall$, $\exists$, $\exists!$)
- use logical connectives symbols (e.g.: $\sim$, $\wedge$, $\vee$, $\implies$, $\iff$) instead of the English words
- within an open sentence, you can use English words that are not logical connectives (e.g.: x is even).
Beware: “ x and y are odd” should be expressed as “ x is odd $\wedge$ y is odd”.
- within an open sentence, you can use math symbols that are not logical connectives (e.g.: $a|b$, $a \equiv b \pmod{n}$)

LaTeX Help

Look here for how to LaTeX: $a \equiv b \pmod{n}$ (i.e., a is congruent to b modulo n).

Exercise. A variant of Exercise 3.1.9b.

§3.1
p97

Theorem 1. For integers a and b , if $a \equiv 7 \pmod{8}$ and $b \equiv 3 \pmod{8}$, then $ab \equiv 5 \pmod{8}$.

a. Symbolically write Thm. 1. As the universe, use: $\mathbb{N}$, $\mathbb{Q}$, $\mathbb{R}$, $\mathbb{Z}$, and/or some cross product of these. See above Warning.

cut this out and put your solution here

b. Prove Theorem 1 using Modulo Arithmetic and the fact that congruence is transitive.

Proof. cut this out and put your proof here

