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.: $a|b$, $a \equiv b \pmod{n}$)

Algebra Review

If you can not easily expand $(2a+3b)^5$ as

$$(2a+3b)^5 = (1)(2a)^5(3b)^0 + (5)(2a)^4(3b)^1 + (10)(2a)^3(3b)^2 + (10)(2a)^2(3b)^3 + (5)(2a)^1(3b)^4 + (1)(2a)^0(3b)^5$$

then review Pascal's Triangle and the Binomial Theorem. Here is a link: Algebra 2.

LaTex Help

Look here for how to LaTex: $a|b$ (i.e., a divides b) as well as $a \nmid b$ (i.e., a does not divides b). Don't forget needed parentheses, e.g., $a|b-1$ does not make sense and should be written as $a|(b-1)$.

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

Theorem 1. For each integer n, if n is odd then 8 divides (n^4+4n^2+11).

a. Sybolically write Theorem 1. As universes, use $\mathbb{Z}$.

cut this out and put your solution here

b. Prove Theorem 1.

Proof. cut this out and put your proof here ■