

Latex help: “a divides b” and “a does not divides b” and “a is congruent to b mod n” and “a is not congruent to b mod n”:

$$a \mid b \quad , \quad a \nmid b \quad , \quad a \equiv b \pmod{n} \quad , \quad a \not\equiv b \pmod{n}.$$

Do not forget needed parentheses: $a \mid (b - 17)$ is correct while $a \mid b - 17$ is not right.

- . **Theorem 1.** For each integer n , if n is odd then 8 divides $(n^4 + 4n^2 + 11)$.
- 1. Symbolically write Theorem 1. As explained in class, since a universe is not specified, you can pick any appropriate universe. Warning, we do not have (and do not make one up) a symbol for the *odd integers*. You need to work the oddness into the open sentence.

- 2. Prove Theorem 1.

HINT. Pascal’s Triangle (and the Binomial Theorem) are helpful in expanding $(x + y)^n$, where $n \in \mathbb{N}$ and $x, y \in \mathbb{R}$. If you need a review, here is a link: [Algebra 2](#).

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DELETE this whole sentence and THEN put your answer to ALL parts down here.