Henceforth, when asked to *symbolically write* a statement follow the below (unless otherwise stated).

(1) If a statement is a quantified open sentence, then use needed quantifier(s) (e.g.: $\forall$, $\exists$, $\exists!$).

Recall

- $\forall$ reads *for alll*
- $\exists$ reads *there exists*
- $\exists!$ reads *there exists a unique.*

(2) Use logical connectives symbols (e.g.: $\sim$, $\wedge$, $\vee$, $\implies$, $\iff$) instead of the English words.

(3) Within an open sentence, you can use English words that are not logical connectives words.

E.g., within your open sentence, one can write: "x is even".

Beware: "x and y are odd" should be expressed as "x is odd $\wedge$ y is odd".

(4) Within an open sentence, you can use math symbols that are not logical connectives.

So you may use, e.g.: $x < \sqrt{2}$, $x = y$, $x + y = 17$, $a|b$, $a \equiv b \pmod{n}$, $\sum_{j=1}^{n} j^2 = \frac{n(n+1)(2n+1)}{6}$.

(5) Symbolically write the statement as it is stated (rather than something logically equivalent).

For example, the statement

$$\text{if a real number is larger than 3, then its square is larger than 9} \tag{1}$$

can be symbolically written as

$$(\forall x \in \mathbb{R}) \left[x > 3 \implies x^2 > 9 \right] . \tag{yes}$$

The statement in (1) is formulated as in (yes) so symbolically write (1) as (yes).

Do NOT symbolically write the statement in (1) as

$$(\forall x \in \mathbb{R}) \left[x^2 \leq 9 \implies x \leq 3 \right] \tag{no}$$

since (no) is not as (1) is formulated. Do note ⟨will help you later⟩ that the statement in (yes) is logically equivanlent to the statement in (no) ⟨since $[P \implies Q] \equiv [(\sim Q) \implies (\sim P)]$, think contrapositive⟩; thus, if you need to prove the statement in (1), then you can prove (yes) or (no) ⟨choice is yours when proving⟩.