Now You Try

The sum of two even numbers is even.

Make sure you know:

1. What every word in the statement means.

2. What the statement as a whole means.

3. Where to start.

4. What your target is.

Even

An integer x is even if (and only if) there exists an integer z, such that $x = 2z$.

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Help me adjust my explanation!

1. Write the statement in predicate logic.
2. Write an English proof.
3. If you have lots of extra time, try writing the symbolic proof instead.

A proof!

What's the analogue of DeMorgan's Laws...

$$\bar{A} \cap \bar{B} = \overline{A \cup B}$$

$$A = B \equiv \forall x (x \in A \leftrightarrow x \in B) \equiv A \subseteq B \land B \subseteq A$$

$$\bar{A} \cap \bar{B} \subseteq \overline{A \cup B}$$

$$\overline{A \cup B} \subseteq \bar{A} \cap \bar{B}$$

Skeleton of an Exists Proof

To show $\exists x(P(x))$

Consider $x =$[the value that will work]
[Show that x does cause $P(x)$ to be true.]
So [value] is the desired x.

You'll probably need some "scratch work" to determine what to set x to.
That might not end up in the final proof!

Divides

> **Divides**
>
> For integers x, y we say $x|y$ ("x divides y") iff there is an integer z such that $xz = y$.

Which of these are true?

2|4	4|2	2|−2
5	0	0	5	1	5