Contrapositive

We showed $p \rightarrow q \equiv \neg q \rightarrow \neg p$ with a truth table. Let's do a proof. Try this one on your own. Remember

- 1. Know what you're trying to show.
- 2. Stay on target take steps to get closer to your goal.

Hint: think about your tools. There are lots of rules with AND/OR/NOT, but very few with implications...

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Help me adjust my explanation!



Quantifiers

We have two extra symbols to indicate which way we're using the variable.

1. The statement is true for every x, we just want to put a name on it.

 $\forall x (p(x) \land q(x))$ means "for every x in our domain, p(x) and q(x) both evaluate to true."

2. There's some *x* out there that works, (but I might not know which it is, so I'm using a variable).

 $\exists x(p(x) \land q(x))$ means "there is an x in our domain, such that p(x) and q(x) are both true.

