To Prove:	**Try this:**
$\forall x\, P(x)$	Let a be arbitrary (in the domain of discourse). Prove $P(a)$.
$\forall x\, \forall y\, P(x, y)$	Let a and b be arbitrary (in the domain of discourse). Prove $P(a, b)$.
$\exists x\, P(x)$	**Existence proof:** Exhibit a specific a (in the domain of discourse). Prove $P(a)$.
$\neg \forall x\, P(x)$	Prove $\exists x \big(\neg P(x)\big)$.
$\neg \exists x\, P(x)$	Prove $\forall x \big(\neg P(x)\big)$.
$p \rightarrow q$	Assume p. (That is, take it as an additional premise.) Prove q (based on the assumption that p is true).
$p \rightarrow q$	Prove the contrapositive, $\neg q \rightarrow \neg p$. That is, assume $\neg q$, and prove $\neg p$.
$p \leftrightarrow q$	Prove $p \rightarrow q$; and prove $q \rightarrow p$.
$p \leftrightarrow q$	Find a sequence of propositions r_1, r_2, $\ldots$, r_k such that p iff r_1 iff r_2 iff $\cdots$ iff r_k iff q
$p \vee q$	Assume $\neg p$. Prove q.
p	**Proof by contradiction:** Assume $\neg p$. Prove some r, where r is a contradiction (that is, $r \equiv \mathbb{F}$).
p	**Proof by cases:** Consider cases $r_1, r_2, \ldots, r_k$ that exhaust all possibilities; that is, $r_1 \vee r_2 \vee \cdots \vee r_k$ is a tautology. (A common possibility is to use q and $\neg q$ for some propostion q.) Prove $r_1 \rightarrow p$, $r_2 \rightarrow p$, $\ldots$, and $r_k \rightarrow p$.
$\forall n \big(n \geq K \rightarrow P(n)\big)$	**Proof by Mathematical Induction.** (Here, the domain of discourse is integers.) Prove $P(K)$. Prove for all $n \geq K$, $P(n) \rightarrow P(n+1)$.

Some General Proof Moves:

- Apply an assumption/hypothesis/premise!
- Apply a definition!
- Apply a previously proved (or known) fact.