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# Notes

**Method of Generalizing from the Generic Particular** To show that every element of a set satisfies a certain property, suppose $x$ is a *particular* but *arbitrarily chosen* element of the set, and show that $x$ satisfies a property.

**Constructive Proofs of Existence** Two methods include:

1. find an $x$ in $D$ that makes $Q(x)$ true or
2. give a set of directions for finding such an $x$.

**Nonconstructive Proof of Existence** involves showing either

1. that the existence of a value of $x$ that makes $Q(x)$ true is guaranteed by an axiom or previously proved theorem or
2. that the assumption that there is no such $x$ leads to a contradiction.

# Test Yourself

1. the integer is the product of two and some integer.
2. the integer is the product of two and some integer plus one.
3. $n > 1$ and for all positive integers $s$ and $r$, $n$ equals $s$ or $r$.
4. a counterexample.