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Direct	proofs of Universal conditional statements
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7	$x \in A$, $P(x) \rightarrow Q(x)$ $\rightarrow P(T) T$
	7 5 5
Goal To	ocus on only those xeA < F T T Yacuously true true
	ocus on only those xe A X F T Yacuously also true true
	also true in that situation
Stort: C	thoose and trong member of A, satisfying itx).
Flore.	The sum of any two even integers is even. time of xy in the set of even integers, x+y is even
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Rear to	V x, y ∈ Z, if x and y are even, then x+y is even
	y J ≡ ,
troof. 1	et x and y be orbitrary integers such that x and y
ave ev	et x and y be orbitrary integers such that x and y er. By difficition, x=2k and y=2m for integers k and m
Now	Kty = 2k+2m by substitution, and xty = 2(1+m) by
tactori	ny since k and m are integers, ktm is an integer.
	•
I Neretoin	e xty is even by definition.
Fact se	enlance. Choose arbitrary member of given set
	entence Choose arbitrary member of given set
	ALL THE WORK
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Direct proofs of universal conditional statements
$\forall x \in A, P(x) \rightarrow Q(x)$ $\rightarrow TTT$
Goal. Tocus on only those x & A that make P(x) time, show that O(x) is also true in that situation
Start Choose orbitrony member of A, satisfying P(x).
Prove. The sum of any two even integers is even. Lost time: of x,y in the set of even integers, x+y is even
Rewrite: V x, y \(\mathbb{Z}, \) if \(\times \) and \(\times \) are even, then \(\times \times \) is even.
troof: Let x and y be arbitrary integers such that x and y are even. By difficition, x=2k and y=2m for integers k and m. Now x+y=2k+2m by substitution, and x+y=2(k+m) by factoring. Since k and m are integers, k+m is an integer.
Therefore x+y is even by definition.
First sentence: Choose arbitrary member of given set (satisfying the hypothesis) ALL THE WORK
Last sentence: conclusion