

## Try it...

What's a possible domain of discourse for these lists of predicates?

1. " $x$  is a cat", " $x$  barks", " $x$  likes to take walks"
2. " $x$  is prime", " $x=5$ " " $x < 20$ " " $x$  is a power of two"
3. " $x$  is enrolled in course  $y$ ", " $y$  is a pre-req for  $z$ "

## Translations

"For every  $x$ , if  $x$  is even, then  $x = 2$ ."

"There are  $x, y$  such that  $x < y$ ."

$\exists x (\text{Odd}(x) \wedge \text{LessThan}(x, 5))$

$\forall y (\text{Even}(y) \wedge \text{Odd}(y))$

## Negation

Let your Domain of Discourse be integers; translate into predicate notation and negate.

There are integers  $x, y$  such that  $xy = 0$ .

Every integer is even.

## Universal Quantifier

$\forall x$

"for each  $x$ ", "for every  $x$ ", "for all  $x$ " are common translations

Remember: upside-down-A for All.

## Existential Quantifier

$\exists x$

"there is an  $x$ ", "there exists an  $x$ ", "for some  $x$ " are common translations

Remember: backwards-E for Exists.