

Suppose  $x \in \mathbb{Z}$ . If  $x$  is odd, then  $x^2$  is odd (In theory this depends on  $x$ .)

In practice, it's read with a universal quantifier:

$\forall x \in \mathbb{Z}$ , if  $x$  is odd, then  $x^2$  is odd.

Negation:

$\exists x \in \mathbb{Z}$ , such that  $x$  is odd and  $x^2$  is not odd.

For each of the following:

1. Write it as a quantified statement.
2. Write its negation.

- Every dog has its day
- We are all in the same boat
- When it rains, it pours
- all that glitters is not gold.

1.  $\forall$  dogs  $\exists$  a day
2.  $\exists$  a dog such that  $\forall$  days it does not have one

•

1.  $\exists$  A boat such that all people are in said boat
2. We are all ~ in the same boat. Or  $\forall$  people there exists a different boat

•

1.  $\forall$  days that rain it pours
2.  $\exists$  a day when it rains where it does not pour

•

1.  $\exists$  glitter that is not gold
2.  $\forall$  things that glitter it must be gold