TOPIC: QUANTIFIERS

Quantifiers

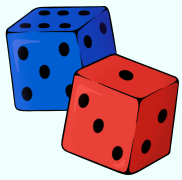
◆ A **Categorical Statement** has a **quantifier** that indicates amount, such as _____, _____, or _____.

Universal Quantifiers	Existential Quantifiers
All people are mammals.	**Some** numbers are less than 10.
No people aren't mammals.	**At least one** number is less than 10.
Examples: _____	Examples: _____

◆ Negate categorical statements by changing the quantifier to one of the _____ type. You may need to add _____

EXAMPLE Identify whether the quantifier in the statement is universal or existential. Then, find the negation and determine the truth value of each.

$(\boldsymbol{A})$ p: Every board game has dice.



[UNIVERSAL | EXISTENTIAL]

$\sim p$: _____ board games _____ dice.

$\sim p$: _____ board games _____ dice.

$(\boldsymbol{B})$ q: There exists a number that is even.

[UNIVERSAL | EXISTENTIAL]

$\sim q$: _____ number that is _____.

Negating Categorical Statements

All ⟷ Some… not/no

None/No ⟷ Some

TOPIC: QUANTIFIERS

EXAMPLE Rewrite the following as an equivalent statement using a different quantifier.

(***A***) All squares are rectangles.

(***B***) Some fruits are apples.

(***C***) Not all puppies are corgis.

(***D***) No cats are dogs.

PRACTICE Determine the truth value of the following statement and find its negation.

(***A***) All squares are rectangles.

(***B***) Some circles are polygons.

(***C***) Not all puppies are corgis.

(***D***) No prime number is even.

PRACTICE Let p: Some people like cats. q: All cats have fur. Represent the following statement symbolically and determine its truth value.

(***A***) At least one cat does not have fur.

(***B***) No people like cats.