Quiz Question

Draw an arrow diagram for the following relation:

A = \{1,2,3\}
B = \{a,b,c\}
R = \{(1,a), (a,b), (2, c), (3, a)\}
Lesson 1 Review

Logical Statements
Universal
Existential
Conditional

Sets
Roster Notation
Builder Notation
Cartesian Product
Lesson 1 Review

Logical Statements

“For every student in the class, that student has studied calculus”
Logical Statements

“For every student in the class, that student has studied calculus”

Universal
Lesson 1 Review

Logical Statements

“There exists a gpa for every student”
Lesson 1 Review

Logical Statements

“There exists a gpa for every student”

Existential - Universal
Lesson 1 Review

Sets
Roster Notation
Builder Notation
Lesson 1 Review

Sets

S = {Hufflepuff, Gryffindor, Ravenclaw, Slytherin}
Lesson 1 Review

Sets
S = \{Hufflepuff, Gryffindor, Ravenclaw, Slytherin\}

Roster
Sets
S = {Hufflepuff, Gryffindor, Ravenclaw, Slytherin}

How would you write this in set builder notation?
Lesson 1 Review

Sets
S = {Hufflepuff, Gryffindor, Ravenclaw, Slytherin}

How would you write this in set builder notation?

\[ S = \{ x \in \text{Hogwards} \mid x \text{ is a house} \} \]
Lesson 1 Review

Cartesian Product

A = \{a, b\}
B = \{star, moon\}

AxB = ?
Lesson 1 Review

Cartesian Product

A = \{a, b\}
B = \{star, moon\}

A \times B = \{(a, star), (a, moon), (b, star), (b, moon)\}
Lesson 1 Review

Cartesian Product

A = \{a, b\}

B = \{star, moon\}

AxB = \{(a, star), (a, moon), (b, star), (b, moon)\}

What’s the Cardinality?
Lesson 1 Review

Cartesian Product

A = \{a, b\}
B = \{star, moon\}

A \times B = \{(a, star), (a, moon), (b, star), (b, moon)\}

What’s the Cardinality? 4
Lesson 2 Review

Relations
Subsets
Arrow Diagrams
Functions
Lesson 2 Review

Relations

Subsets

Defn: Let A, B be sets, a Relation R is a subset of the cartesian product of AxB
Lesson 2 Review

Relations
Subsets

Defn: Let A, B be sets, a Relation R is a subset of the cartesian product of AxB

Set of all numbers
Lesson 2 Review

Relations
Subsets

Defn: Let $A, B$ be sets, a Relation $R$ is a subset of the cartesian product of $A \times B$

\[
R = \{(x,y) \text{ exists in } R^2 \mid x < y\}
\]
Lesson 2 Review

Relations
Path Diagrams

A = \{1, 2, 3\}
B = \{a, b, c\}
R = \{(1, a), (a, b), (2, c), (3, a)\}
Lesson 2 Review

Functions

Defn: A function $f$ from $A$ (domain) to $B$ (Range) is a relation on $A \times B$ s.t.
Lesson 2 Review

Functions

Defn: A function $f$ from $A$ (domain) to $B$ (Range) is a relation on $A \times B$ s.t.

1. (A) every $x$ in $A$ there exists (E) in $B$ s.t. $(x,y)$ exists in $f$
2. If $(x,y)$ in $f$ and $(x,z)$ in function $f$, then $y = z$
1. What kind of statement is: “for every cat there exists a vaccine”?
2. What kind of set notation is: \( S = \{ x \in R | 13 < x < 20 \} \)
3. Write the above set in the opposite notation.
4. Give the cartesian product for: \( A = \{1,2\}, B=\{z, x\}, \ C = \{\text{red, blue}\} \)
5. What is the cardinality of the cartesian product above?
6. Give arrow diagram for: $X \times Y$ (cartesian product) where:
$X = \{1, 2, 3\}, \ Y = \{\text{enterprise, voyager}\}$

7. Is the above a function?

8. Why or why not?
1. What type of statement is: \( \forall x \in S \)

2. Is the set \{1,3,5\} equal to \{1, 5, 3\}? Why?

3. Give the elements in the set \{x | x is the square of an integer and x<100\}

4. Change this set to set builder notation:
   a. \{0, 3, 6, 9, 12\}

5. Make an arrow diagram for \{(1,3), (0, 0), (2, 6), (4, 12), (3, 9)\}.

6. Is this a function? Can you find the relation?