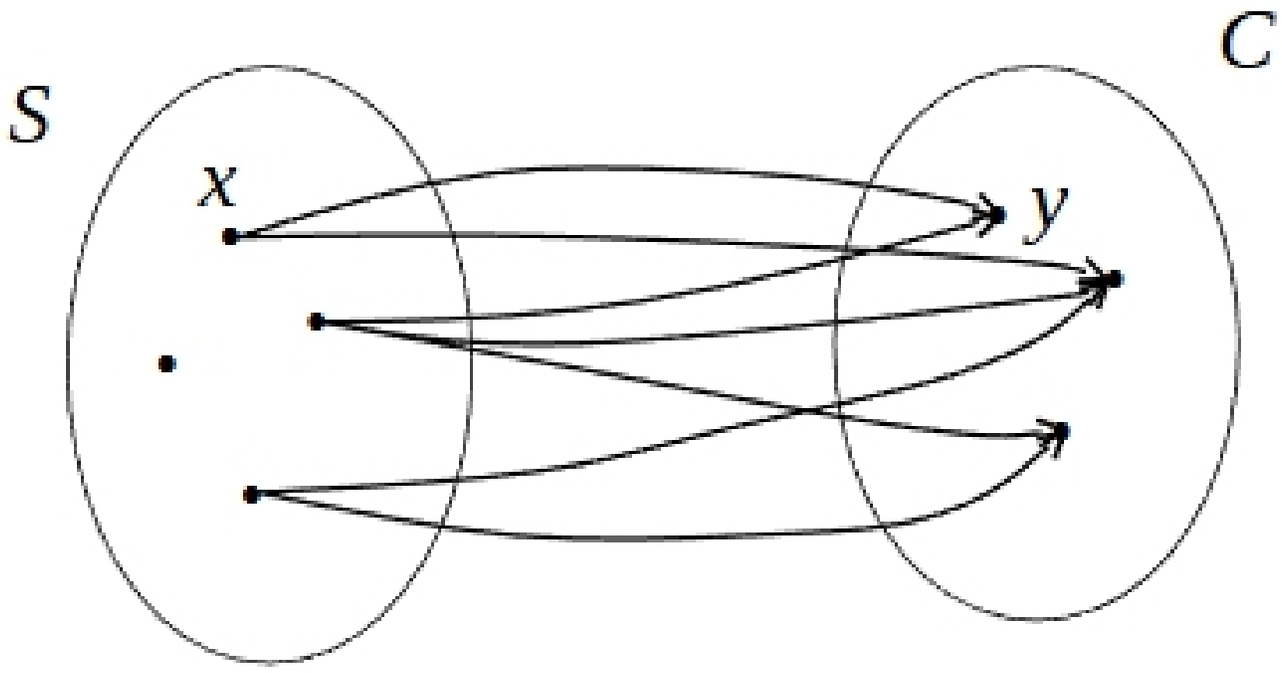
Today's topics:

- The notion of a relation
- properties of relations on a set

Relations

- A "**relation**" is a fundamental mathematical notion expressing a relationship between sets
- It's an **abstract** notion useful for modeling many different relationships

Example. Let S be set of UCF students, and C be a set of classes. Then we can consider the relation "is taking class" from S to C



This relation can be described by the set of pairs:

"is taking class"=$\{(x, y)|\ x \in S, y \in C$ and student x is taking class $y\}$

More examples of relations:

- "parent-of"
- "child-of"
- "likes"
- "meet one another today"
- "less then" = $\{(a, b) \mid a, b \in A \text{ and } a<b\}$
  where $A=\{1, 2, \ldots 10\}$
- "equal" = $\{(a, b) \mid a, b \in \text{Power}(A) \text{ and } |a| = | b | \}$
- "subset" = $\{(a, b) \mid a, b \in \text{Power}(A) \text{ and } a \subseteq b \}$
- If R is set of real numbers, R $\times$R is set of points (x, y) in plane.
  "circle"=$\{(x, y) \mid x, y \in \text{R} \text{ and } x^2+y^2=1\}$