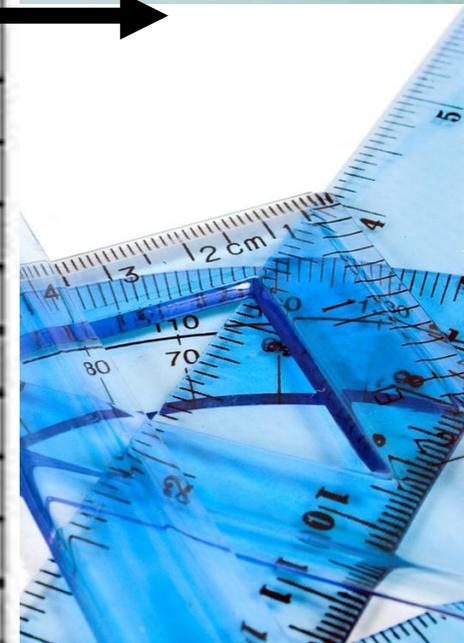
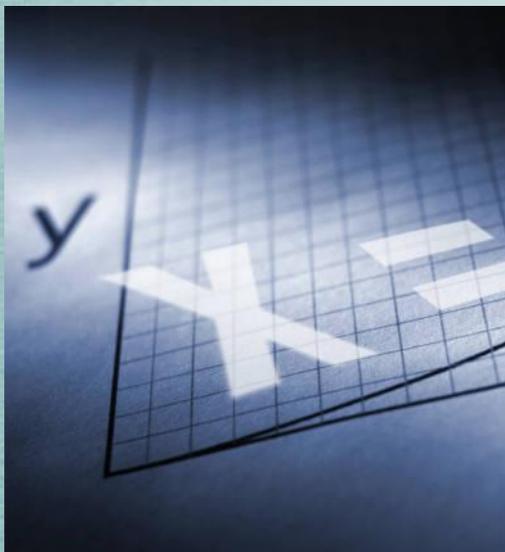
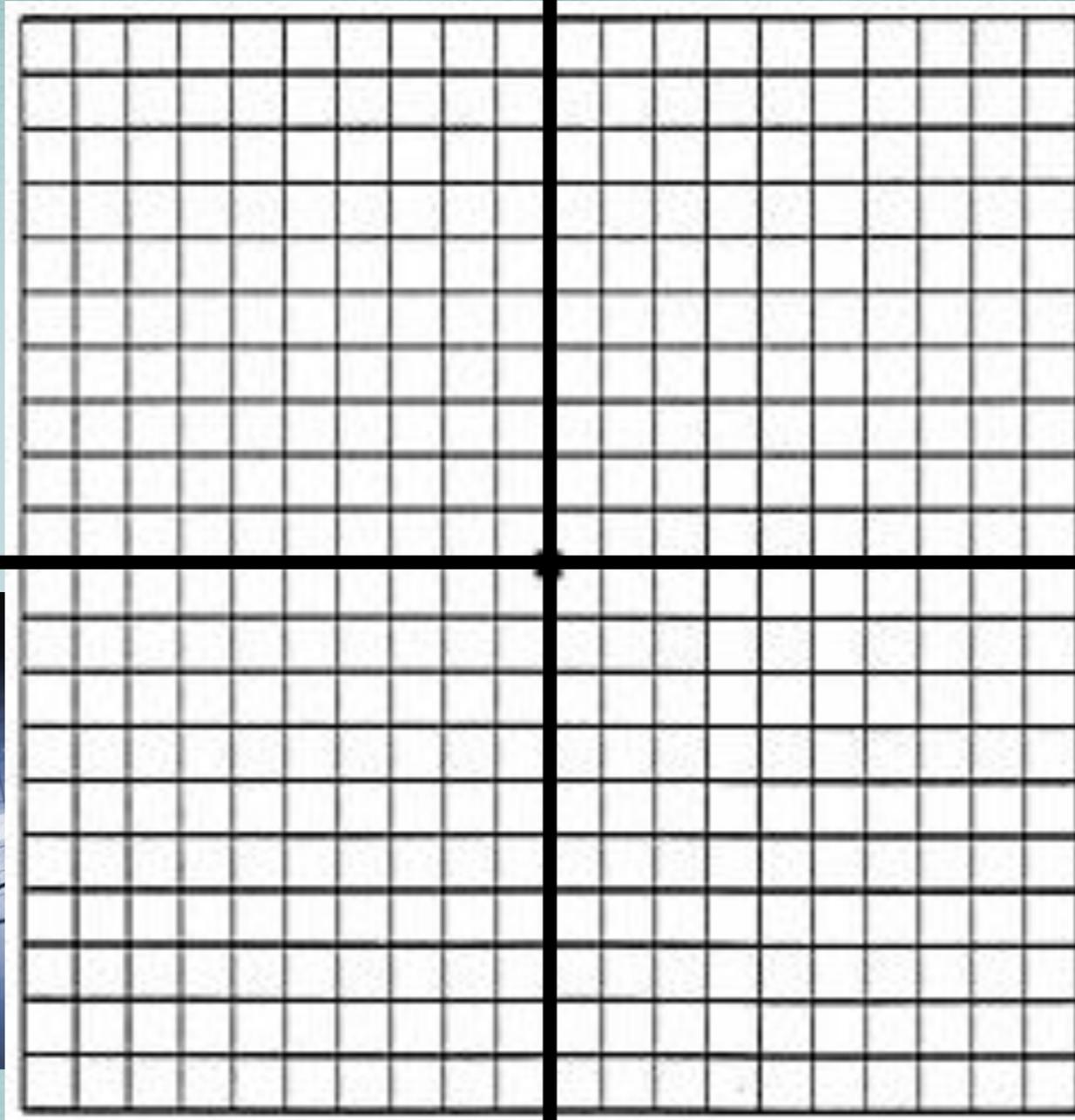


Coordinates and the Cartesian Plane

Background Information and
Club Function Rules







Relations and Functions

- * A **relation** is a pairing between two sets of numbers
- * It is usually written as a set of ordered pairs
- * Example:
 $\{(11, 63), (12, 64), (13, 65), (14, 70), (15, 72), (16, 72)\}$
- * A **function** is a special type of relation...

Domain and Range

$\{(1, 3), (3, 5), (4, 3), (2, 8)\}$

$\{(3, 7), (10, 13), (4, 9), (10, 8), (12, 4)\}$

- * The **domain** of a relation is the set of first coordinates of the ordered pairs
- * The **range** of a relation is the set of second coordinates of the ordered pairs
- * We can also visualize this graphically

Linear Functions

* Sometimes, instead of writing coordinates that belong to a certain function, we write them as an equation with two variables, usually x and y

* Examples:

$$d = 5t$$

$$3x + 2y = 10$$

$$y = 5x$$

$$-10p = 2q + 1$$

* Each of these has infinite solutions that can be written in coordinate form

Practice

* Complete each ordered pair so it is a solution to the equation $2x + y = 9$

* $(1, ?)$

* $(5/2, ?)$

* $(?, 9)$

* $(4, ?)$

* $(1, 7)$

* $(5/2, 4)$

* $(0, 9)$

* $(4, 1)$



Club Function: A Game

Rules for Getting into Club Function



- Everyone must be either a zebra or a rhinoceros
- Each zebra or rhinoceros must associate with a group of other zebras or rhinoceroses, according to these rules:
 - Each zebra can **ONLY** be in a group with **ONE** rhino
 - Each rhino must **ALWAYS** be with **AT LEAST ONE** zebra

How this Game Is Like Mathematical Functions



- Zebras are like the x-coordinates and rhinos are like the y-coordinates
- Each x-coordinate can only be paired with one y-coordinate
- Examples: Are these relations functions?

$\{(1, 3), (3, 5), (4, 3), (2, 8)\}$

$\{(3, 7), (10, 13), (4, 9), (10, 8), (12, 4)\}$