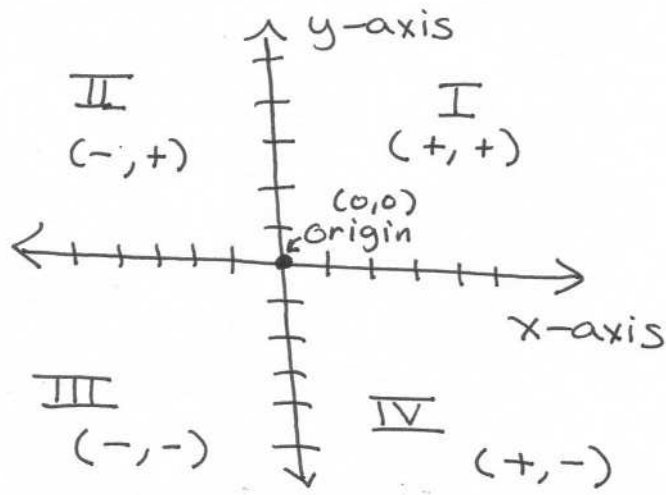


The Rectangular Coordinate System

AKA The Cartesian Coordinate System



point = (x, y)

x-coordinate (abscissa)
y-coordinate (ordinate)

The Distance Between Two points (x_1, y_1) & (x_2, y_2)

The Distance Formula

* This is a length. *

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Example: Find the distance between points $(3, -5)$ and $(2, 9)$.

$$D = \sqrt{(9 - (-5))^2 + (2 - 3)^2}$$

$$D = \sqrt{(14)^2 + (-1)^2} = \sqrt{196 + 1} = \sqrt{197} \approx 14.04$$

Midpoint Formula

(x_1, y_1) (x_2, y_2)

* this is a point *

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Example: $(3, -5)$ $(2, 9)$

$$\text{midpoint} = \left(\frac{3+2}{2}, \frac{-5+9}{2} \right) = \left(\frac{5}{2}, 2 \right)$$