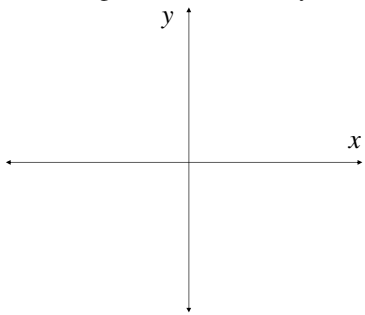
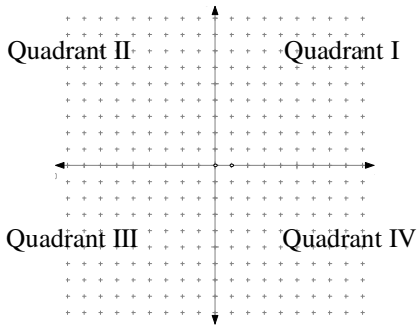


Section 2.1

The Rectangular Coordinate System





Please Bring Graph Paper to
Class!!!

Bring your TI-83 calculator to class!

Definition

An ordered pair has the form (a, b)

a is called the x - coordinate

b is called the y - coordinate

Every ordered pair has a unique location
on the rectangular coordinate system.

Every point on the rectangular coordinate
system can be labeled with an ordered pair.

Plot the following ordered pairs

$(2,3)$ $(-3,4)$

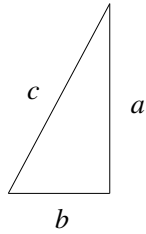
$(-5,-2)$ $(4,-3)$

$(2,0)$ $(0,7)$

The Pythagorean Theorem

Given any
right triangle

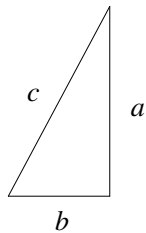
$$a^2 + b^2 = c^2$$



In general

$$a^2 + b^2 = c^2$$

$$c = \sqrt{a^2 + b^2}$$



A baseball diamond is a square that measures 90 feet on each side. Find the distance between first and third base.

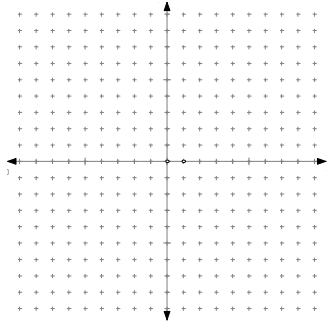
A soccer field has a rectangular shape with a 100 yd width and a 130 yd length. Find the length of the diagonal.

Distance Formula

The distance between two ordered pairs (x_1, y_1) and (x_2, y_2) is given by the formula

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

Distance Formula



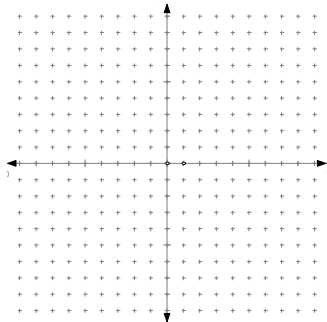
Find the length of the line segment that joins the points $P(-8,4)$ and $Q(3,-2)$.

Midpoint Formula

The midpoint of the line segment connecting (x_1, y_1) and (x_2, y_2) is given by the formula

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

Midpoint Formula



Find the midpoint M of the segment with endpoints $(8,-4)$ and $(-9,6)$.
