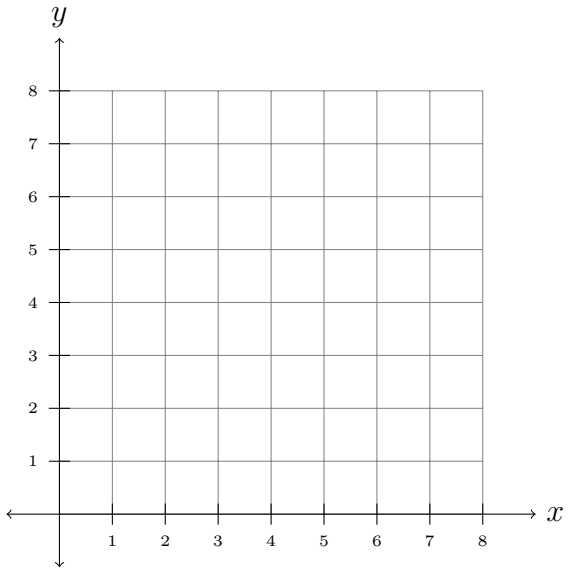
Name: _____

MA162-020
2010-06-10

Quiz on 1.1: Coordinates and distance



Draw the points $(7,1)$, $(6,8)$, $(2,1)$, and $(5,5)$.

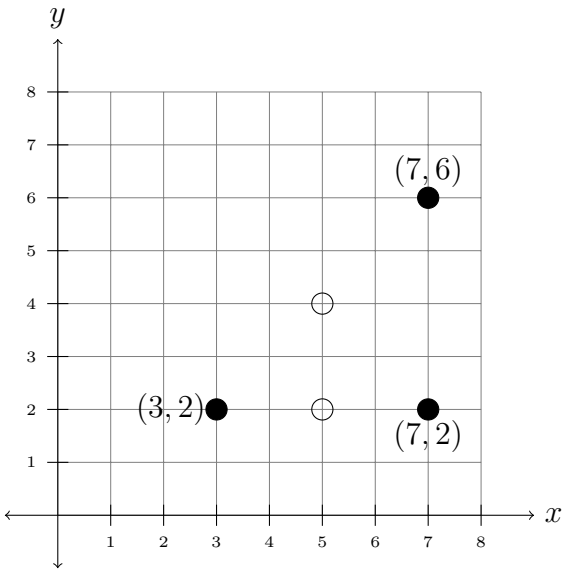
What is the distance between $(2,1)$ and $(7,1)$?

What is the distance between $(2,1)$ and $(5,5)$?

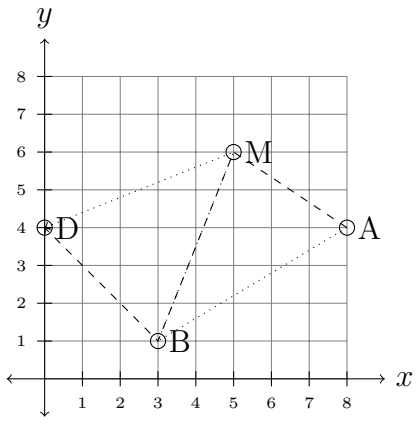
How far is 3 from 7? What number is halfway between?

How far is $(3,2)$ from $(7,2)$? What point is halfway between?

What number is halfway between 2 and 6?
What point is halfway between $(3,2)$ and $(7,6)$?



Label the midpoints you calculated.



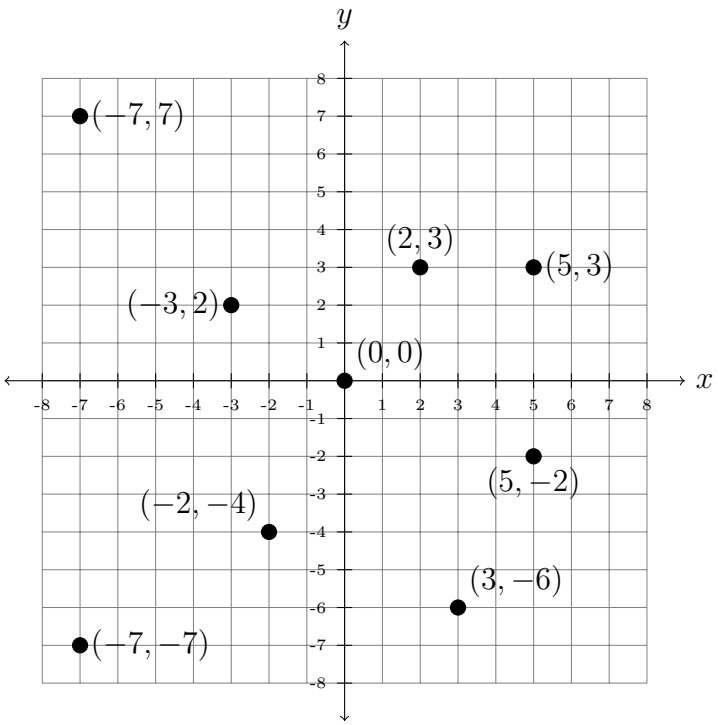
A salesman travels from Atlanta to Dallas, visiting Baton Rouge and Memphis along the way. He is unsure which city to visit first. Which way minimizes the distance?

Trip	Distance
AB	_____
BM	_____
MD	_____
AM	_____
MB	_____
BD	_____

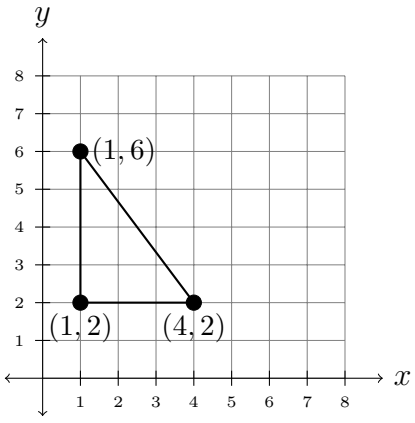
Examples for 1.1: Coordinates

Be able to draw points given the coordinates, and be able to give coordinates for a point that is drawn. The point $(0, 0)$ is the **origin** and the locations of all other points are described in relation to the origin. The point $(2, 3)$ is drawn and labelled; it is $x = 2$ units to the right of the origin, and $y = 3$ units above the origin.

Negative values indicate the opposite direction, either left or down. For instance $(-7, 7)$ has $x = -7$, so it is 7 units to the left of the origin, and it has $y = 7$, so it is 7 units above the origin. The point $(-7, -7)$ is far away. Though it has $x = -7$ and so is 7 units left of the origin, it has $y = -7$ and so is 7 units below the origin.



Examples for 1.1: Distance



The points $(1, 2)$ and $(1, 6)$ are $6-2 = 4$ units apart. The points $(1, 2)$ and $(4, 2)$ are $4 - 1 = 3$ units apart. To find the distance between $(1, 6)$ and $(4, 2)$ we use a right triangle and the Pythagorean theorem to get that the distance is $\sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$.

This is sometimes expressed as the **distance formula**: the distance between (x_1, y_1) and (x_2, y_2) is

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

Quadrants:

The coordinate plane is divided into four quadrants labelled with roman numerals, counter-clockwise. For example $(4, 4)$ is in the first quadrant, $(-4, 4)$ is in the second quadrant, $(-4, -4)$ is in the third quadrant, and $(4, -4)$ is in the fourth.