Distance and Midpoint in the Coordinate Plane

Today I Can

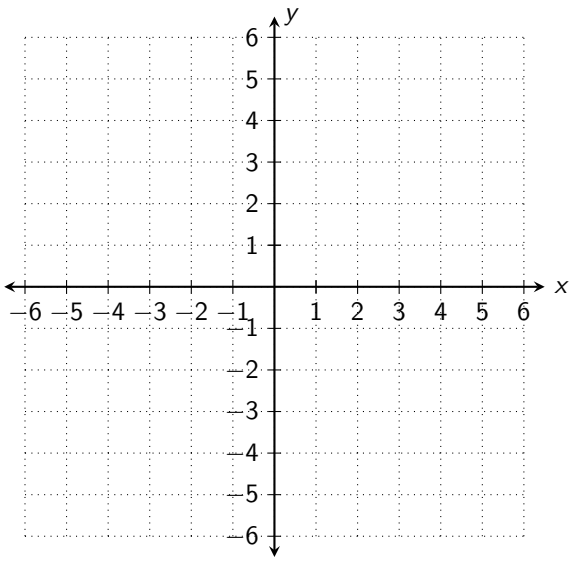
1. Find the distance between 2 points in the coordinate plane.
2. Find the midpoint of a segment in the coordinate plane.

Distance in the Coordinate Plane

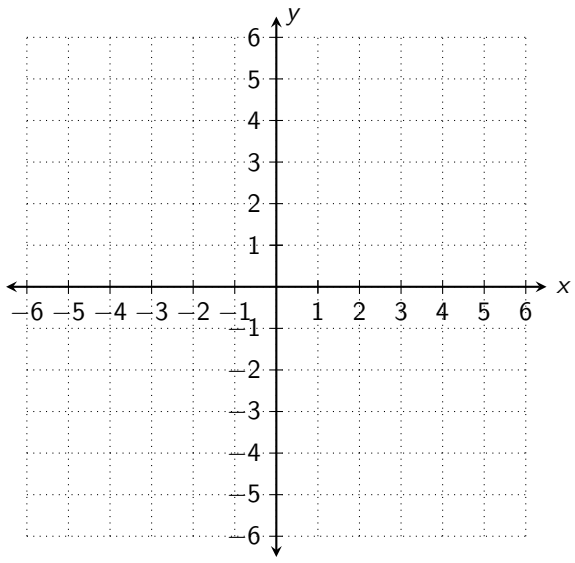
To find the distance between 2 points in the coordinate plane, you can use the Pythagorean Theorem $a^2 + b^2 = c^2$.

Example 1. Find the distance between each pair of points.

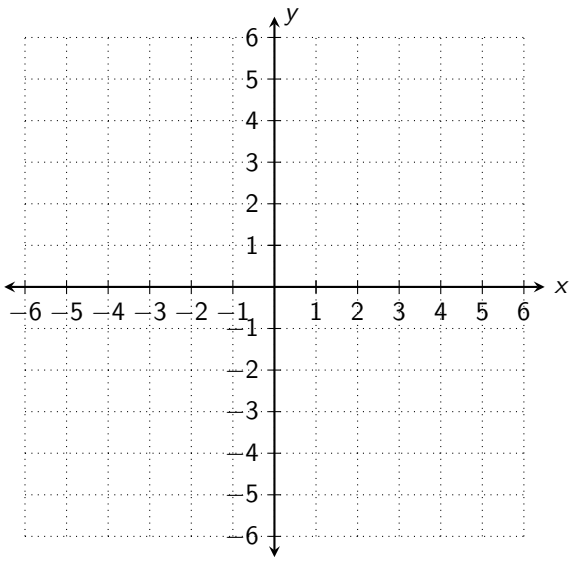
(a) (5, 3) and (−4, 6)



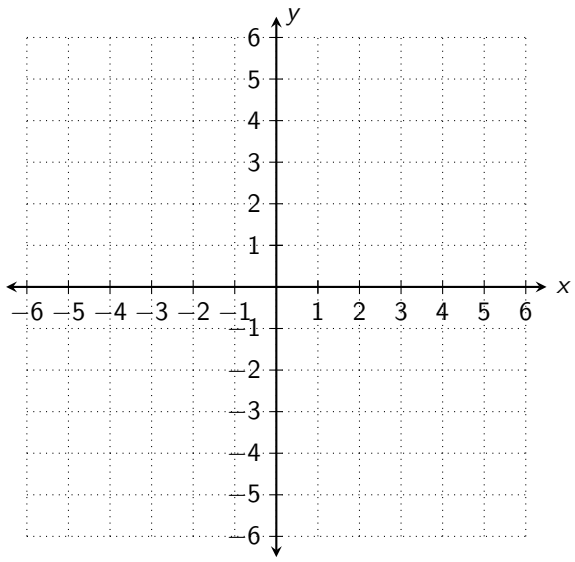
(b) (0, −6) and (3, −1)



(c) (1, 5) and (−2, 5)



(d) (3, 4) and (3, −3)

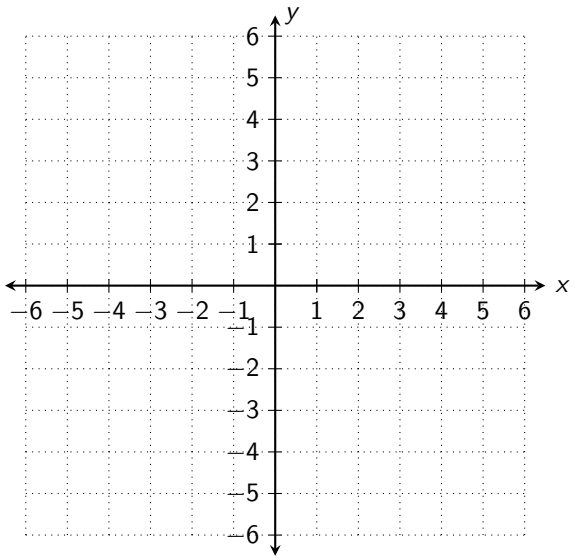


Midpoint in the Coordinate Plane

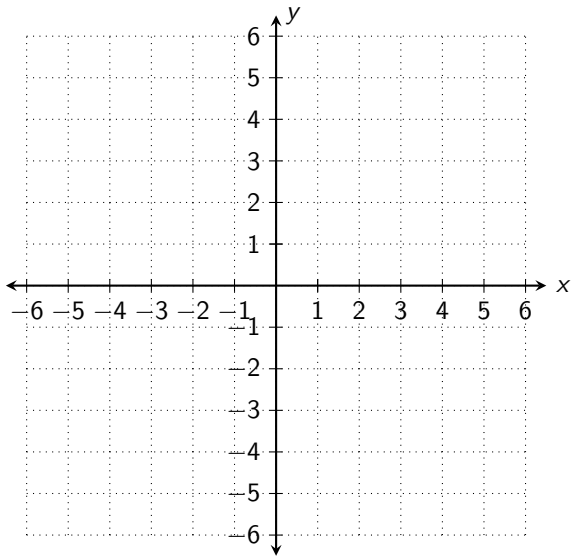
To find the **midpoint** between 2 points, find the average of the x-coordinates and the average of the y-coordinates.

Example 2. Find the midpoint of each pair of points.

(a) $(4, -6)$ and $(3, -4)$

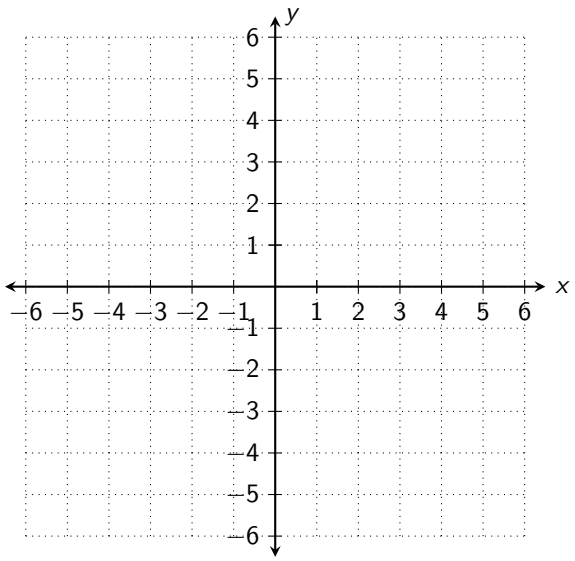


(b) $(-5, 1)$ and $(-5, 4)$



Example 3. Find the coordinates of B if M is the midpoint of $\overline{AB}$.

(a) $A(-2, -1)$; $M(-4, 0)$



(b) $A(6, -5)$; $M(3, 3)$