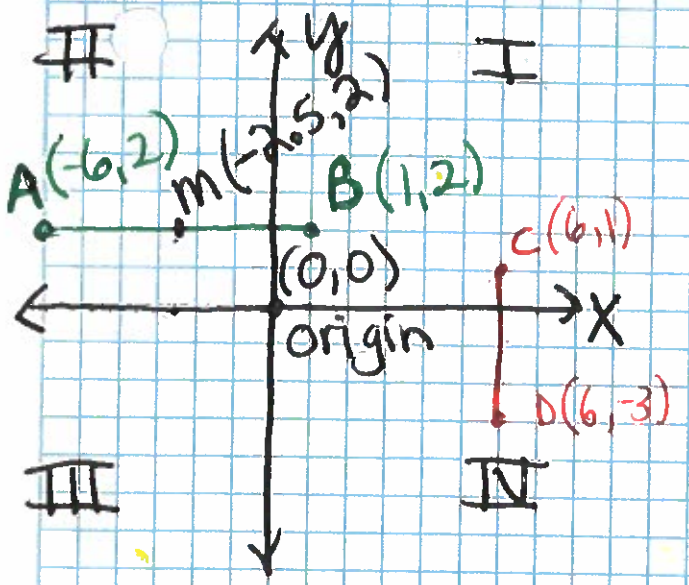
1.8 The Coordinate Plane

Day 6



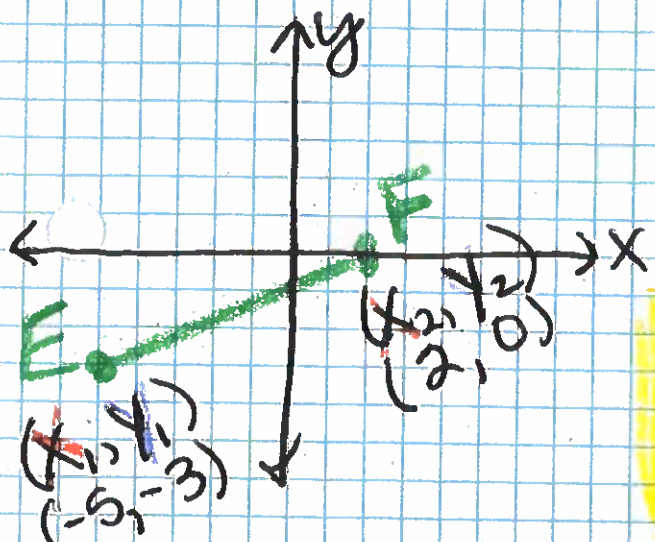
(x, y)

$A(-6,2)$ $B(1,2)$

Length $\overline{AB}$. = 7 units

$C(6,1)$ $D(6,-3)$

Length $\overline{CD}$. = 4 units



$E(-5,-3)$ $F(2,0)$

① Length $\overline{EF}$.

Distance Formula

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

$$d = \sqrt{(2 - -5)^2 + (0 - -3)^2}$$

$$d = 7.6$$

ex $(12, -12)$ $(5, 12)$
x_2 y_2 x_1 y_1

$$d = \sqrt{(12-5)^2 + (-12-12)^2}$$

$$\sqrt{(7)^2 + (-24)^2}$$

$$\sqrt{49 + 576}$$

$$\sqrt{625}$$

$$\boxed{d = 25}$$

2) **Midpoint**: average x's & average y's

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

ex) Midpoint (12, -12) and (5, 12)

$$\left(\frac{12+5}{2}, \frac{-12+12}{2}\right)$$

midpoint (8.5, 0)

ex) A(-6.3, 5.2) B(1.8, -1)

midpoint $\overline{AB}$ = (-2.25, 2.1)

x's → $\left(\frac{-6.3+1.8}{2}, \frac{5.2+-1}{2}\right)$ ← y's

3) Finding an Endpoint

like 30+31 on HW

The midpoint is (3,4) of $\overline{AB}$. One endpoint A(-3,-2). Find the coordinates of B(other endpoint).

$\frac{-3+x}{2} = 3$ $\quad \frac{-2+y}{2} = 4$

$-3+x = 6$ $\quad -2+y = 8$

$+3 \quad +3$ $\quad +2 \quad +2$

$x = 9$ $\quad y = 10$

Answer: B(9,10)

(ex) $\overline{XY}$ has a midpoint of (4, -6) and X (2, -3). Find the coordinates of Y.

To Find the x value of Y

x-values of endpoints → $\frac{2+x}{2} = 4$ ← x-value midpoint

$2 + x = 8$

$-2 \quad -2$

$x = 6$

To Find the y value of Y.

y-values of endpoint → $\frac{-3+y}{2} = -6$ ← y-value midpoint

$-3 + y = -12$

$+3 \quad +3$

$y = -9$

Answer: Y(6, -9)