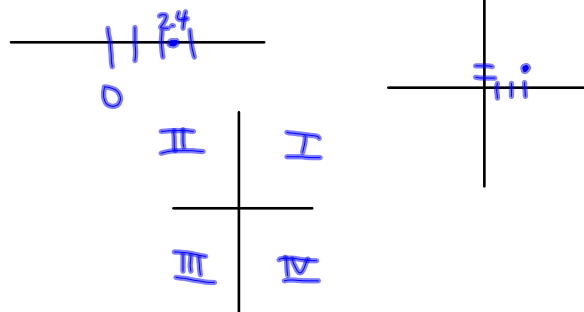


## P2 Cartesian Coordinates

- Obj: 1. Plot points  
 2. Find the <sup>\*</sup>distance between  
 & the <sup>\*</sup>midpt. of 2 pts.

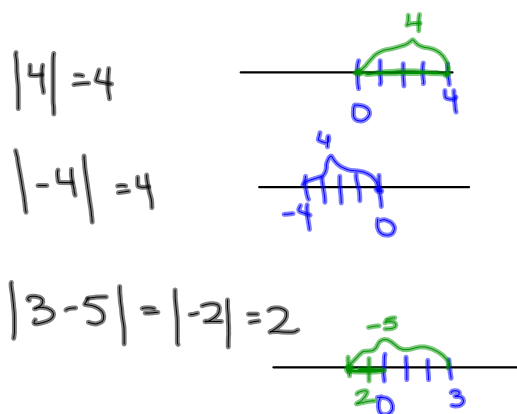
$(x, y)$  → Cartesian coordinate

2.4  $(\underset{x}{3}, \underset{y}{2})$



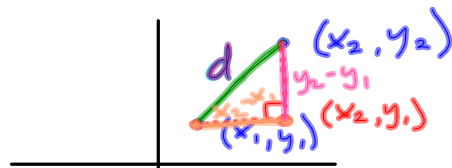
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Absolute Value: measures the  
distance from 0.  
 always positive



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# Distance Formula

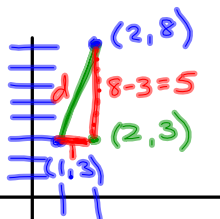


$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{d^2}$$

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

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Find the distance between:  $(x_1, y_1) = (1, 3)$  and  $(x_2, y_2) = (2, 8)$



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

$$d = \sqrt{(2 - 1)^2 + (8 - 3)^2}$$

$$d = \sqrt{1^2 + 5^2}$$

$$= \sqrt{26} \approx 5.1$$

exact      approx.

$$d^2 = 1^2 + 5^2$$

$$\sqrt{d^2} = \sqrt{26}$$

$$d = \sqrt{26}$$

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Midpoint: middle  $\rightarrow$  average  
 $(x_1, y_1)$   $(x_2, y_2)$

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

Find the midpoint:  $(-5, 2)$   $(3, 7)$

$$\left( \frac{-5+3}{2}, \frac{2+7}{2} \right)$$

$$\left( \frac{-2}{2}, \frac{9}{2} \right)$$

$$(-1, 4.5)$$

Find the midpoint: 2, 26  
average

$$\frac{2+26}{2} = 14$$

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