

## 1.3b The Formulas

Midpoint Formula  
For  $A(x_1, y_1)$  &  $B(x_2, y_2)$

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

Distance Formula

For  $A$  &  $B$ ,

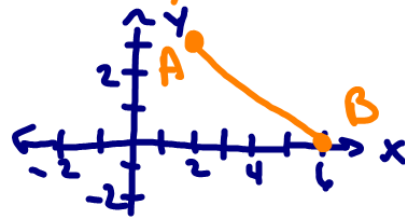
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Example

Find midpoint & distance of  $A(2, 3)$  &  $B(6, 0)$

Midpoint (add &  $\div$  by 2)

$$M\left(\frac{2+6}{2}, \frac{3+0}{2}\right) = M(4, 1.5)$$



Distance (subtract, square, combine &  $\sqrt{\quad}$ )

$$d = \sqrt{(6-2)^2 + (0-3)^2} = \sqrt{\underset{16}{(4)^2} + \underset{9}{(-3)^2}} = \sqrt{25} = \textcircled{5}$$

$$\frac{-16 \cdot K}{-16} = \frac{+8}{+16}$$
$$= \frac{1}{2}$$