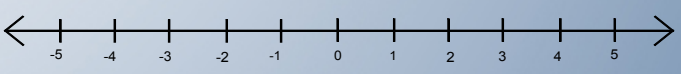
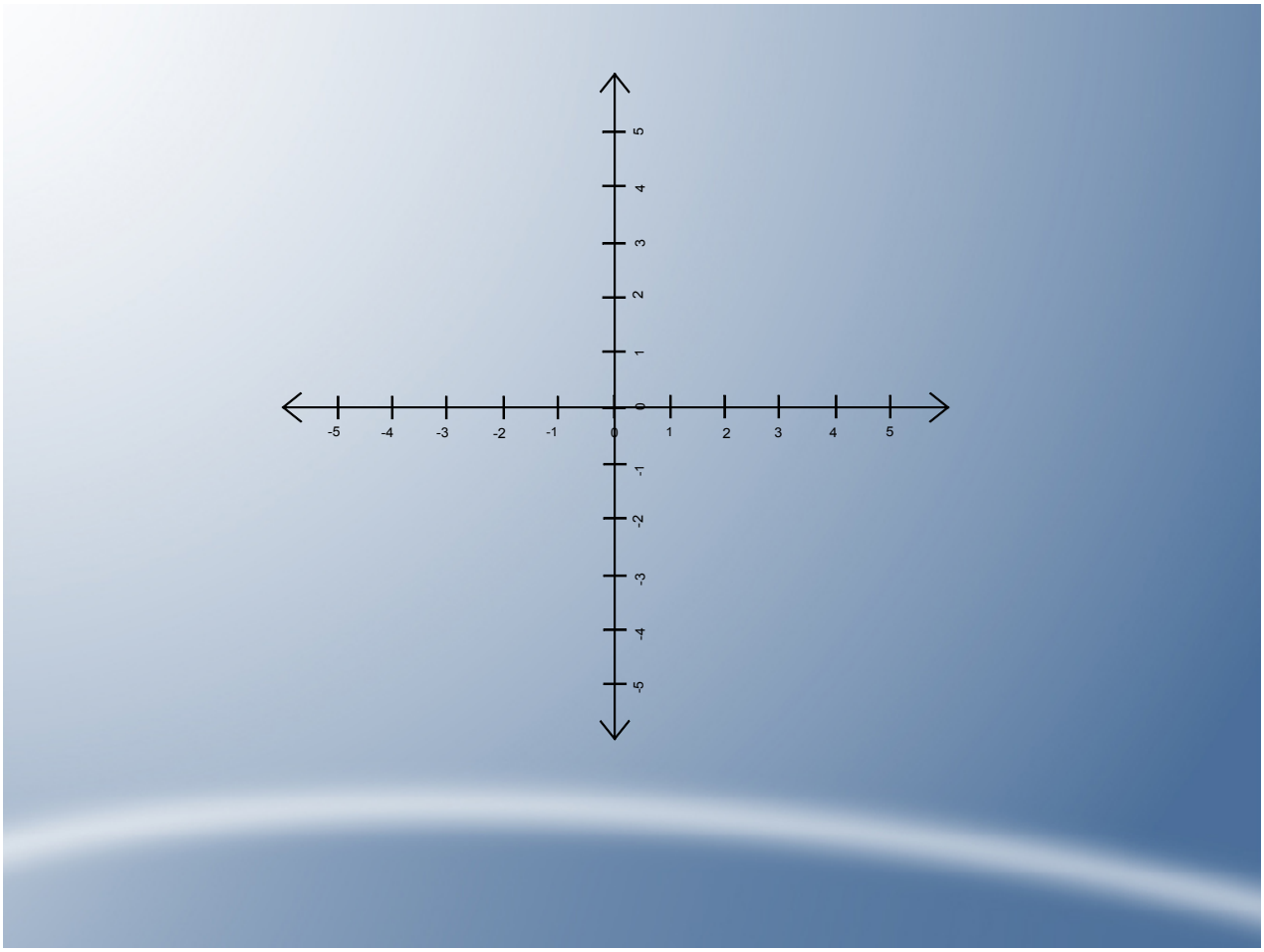
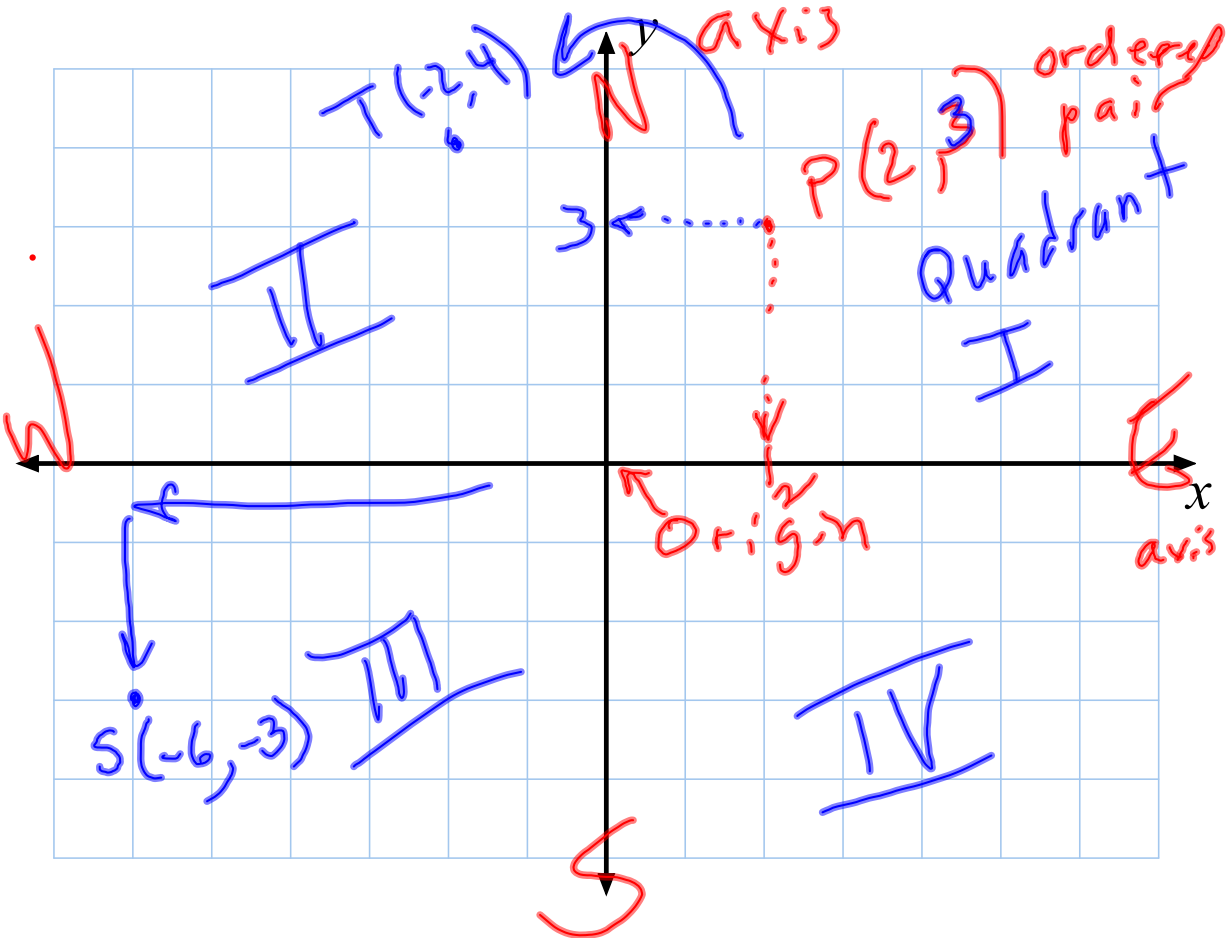
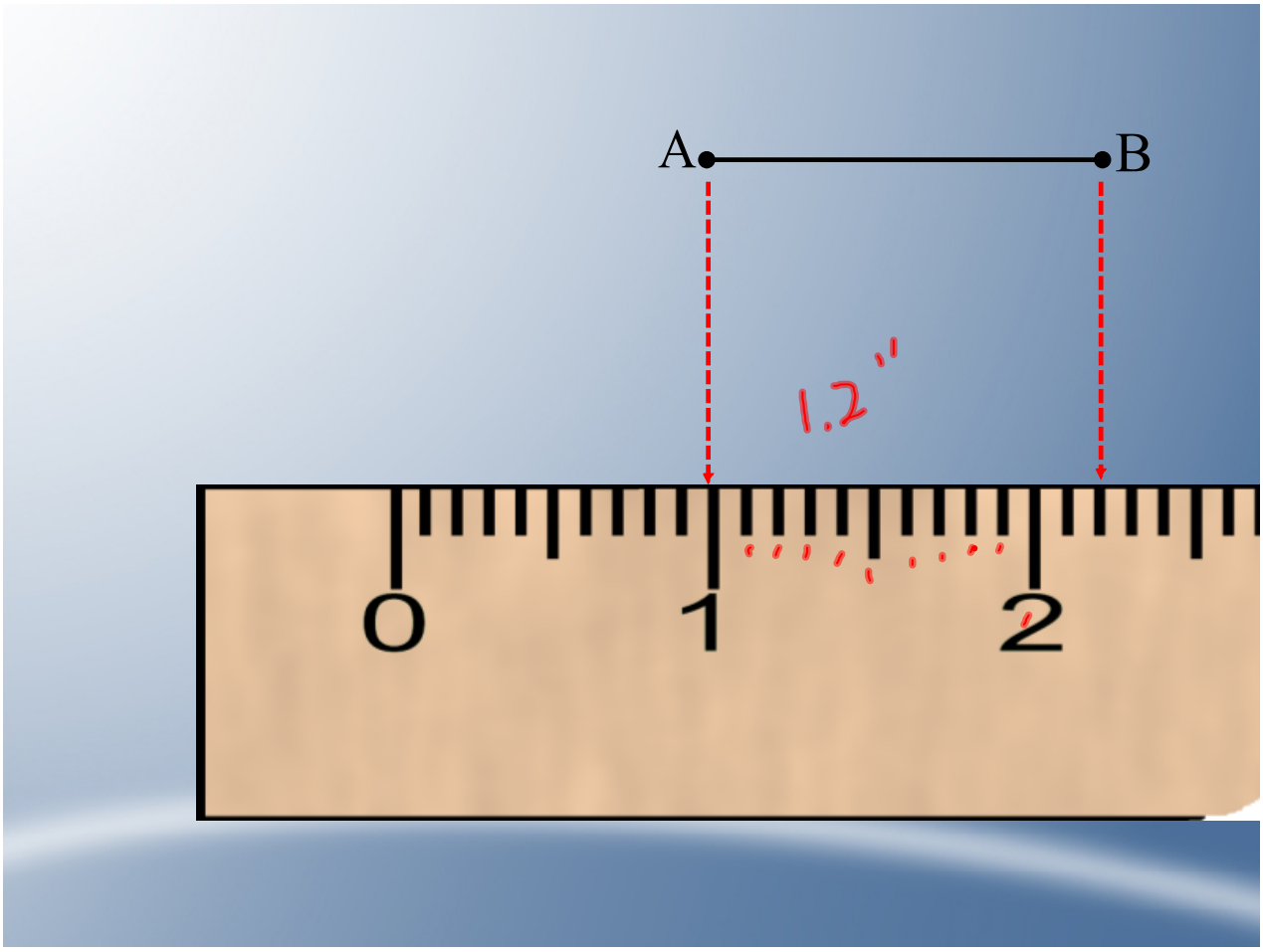
René Descartes

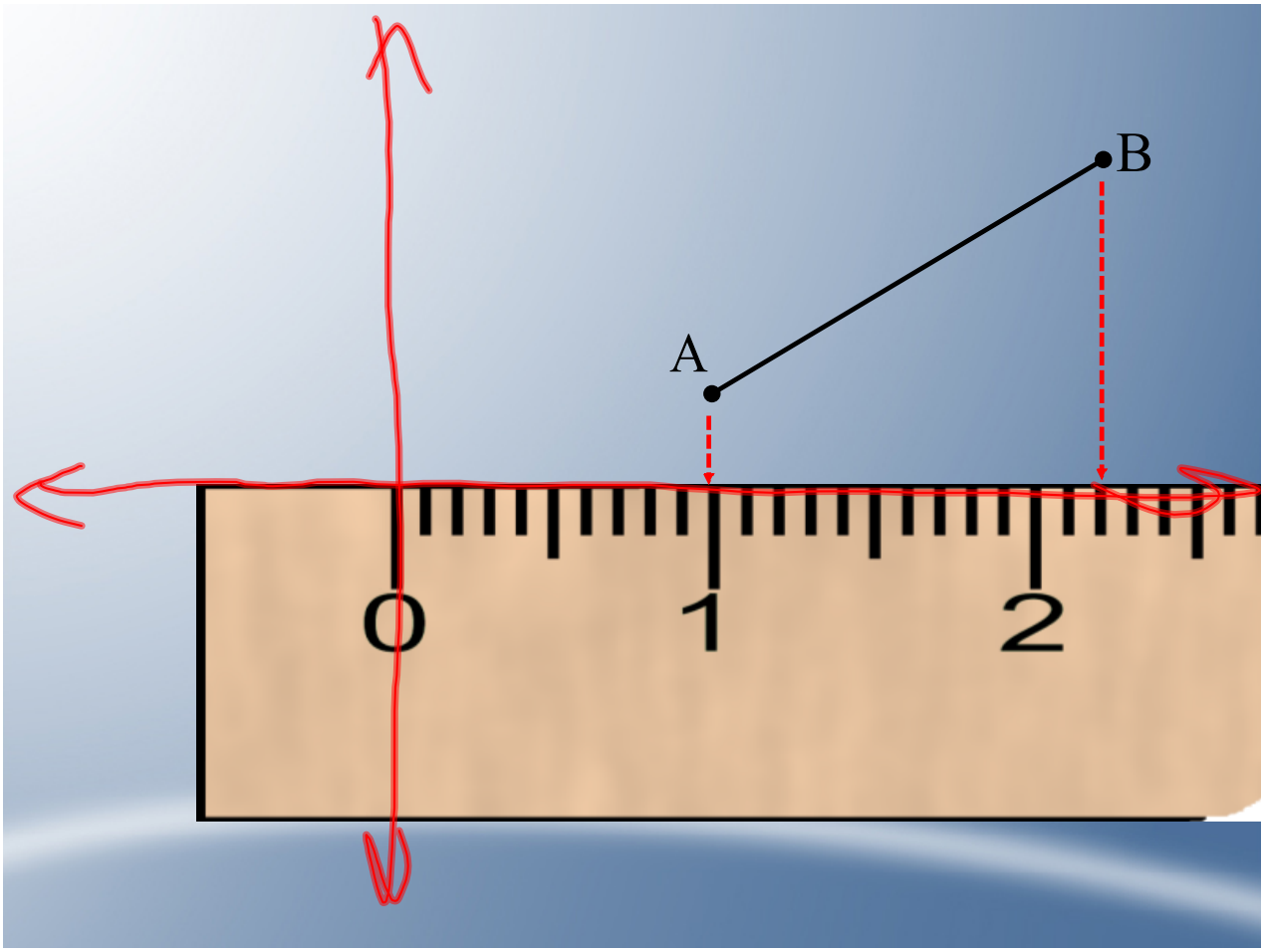
- ~ 1600's
- Invented the Cartesian coordinate system after watching a fly buzz around the ceiling

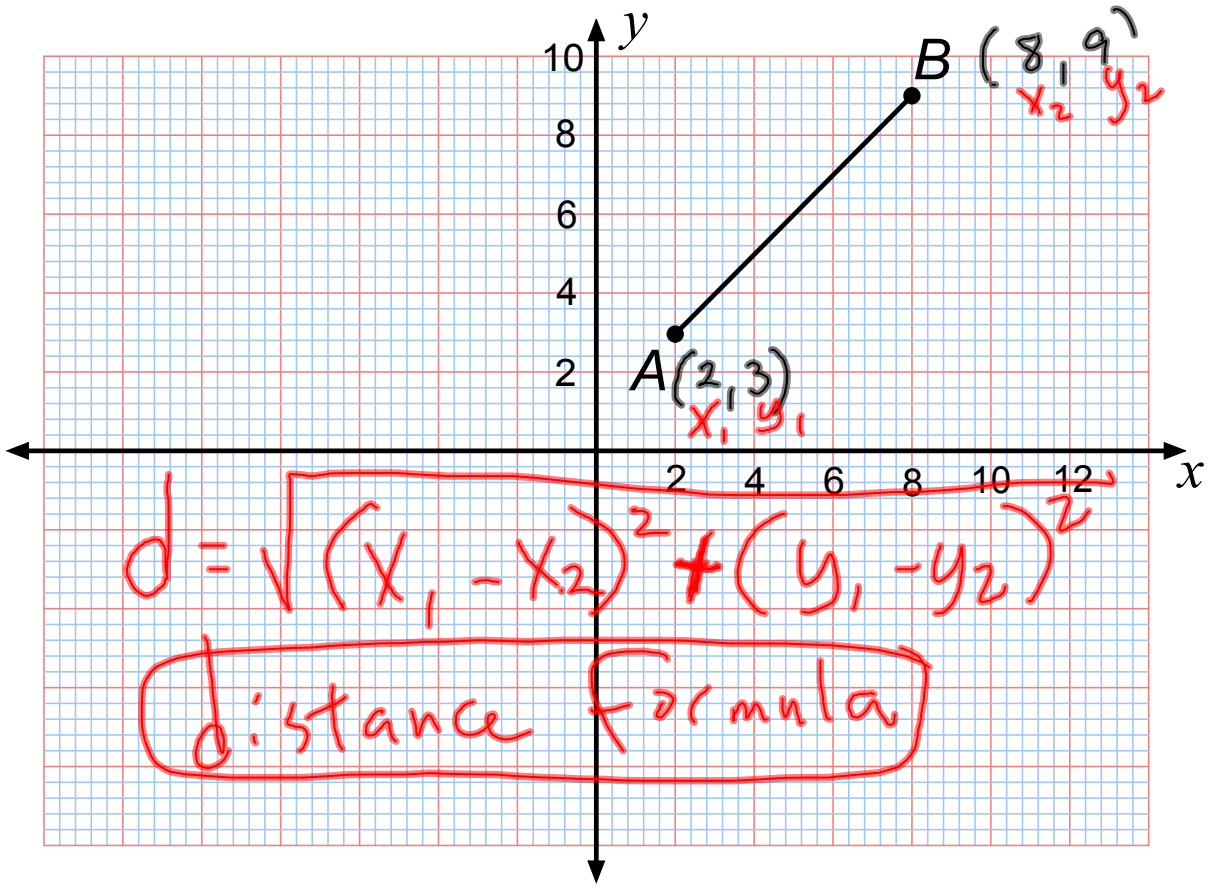





y
x
T(-2,4)
axis
N
P(2,3)
ordered pair
3
Quadrant
I
II
W
E
Origin
S(-6,-3)
III
IV
S


A
B
1.2''
0
1
2


B
A
0
1
2



Example (pg 46 #6)

E(6, -2) x_1 y_1

F(-2, 4) x_2 y_2

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

$= \sqrt{(6 - (-2))^2 + (-2 - 4)^2}$

$= \sqrt{(8)^2 + (-6)^2}$

$= \sqrt{64 + 36}$

$= \sqrt{100} = 10$

B(-4, -5)

C(5, 8)

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

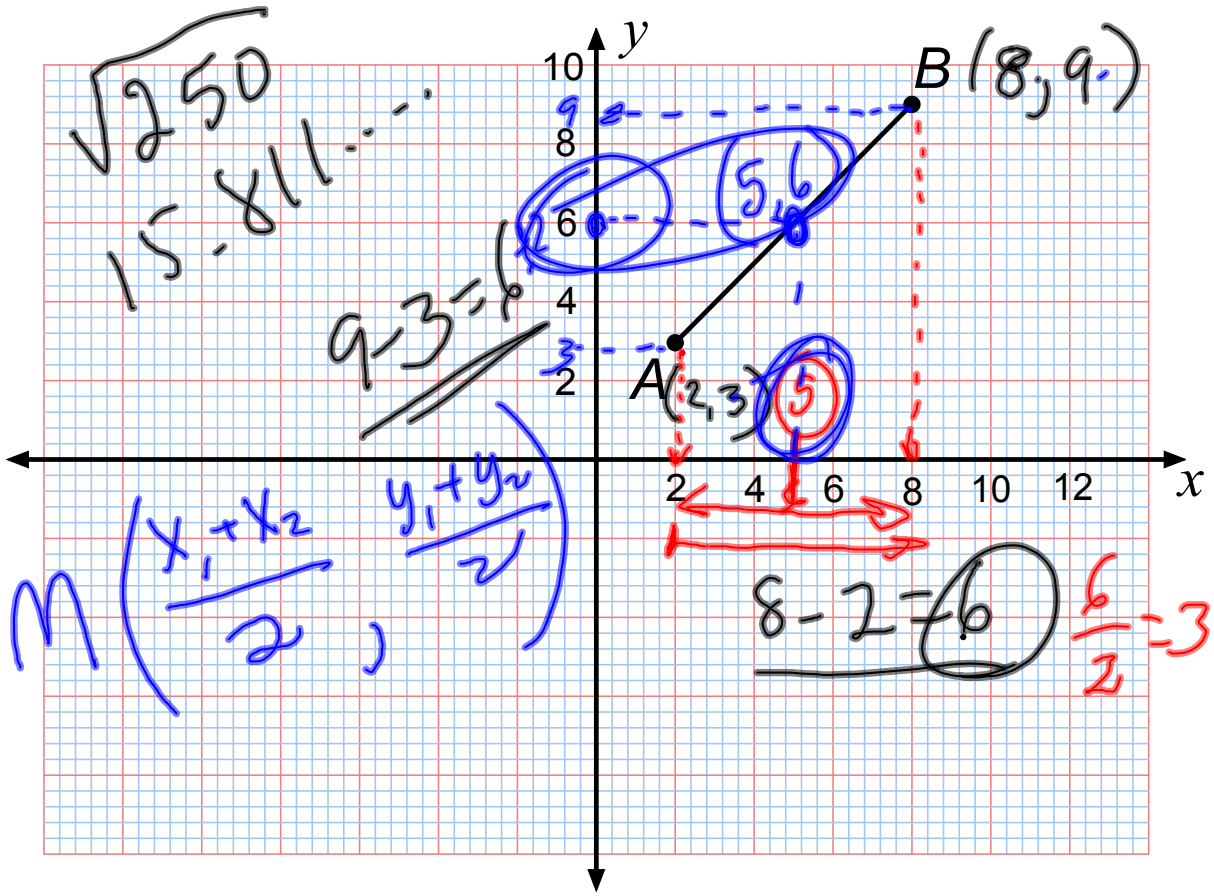
$d = \sqrt{(-4-5)^2 + (-5-8)^2}$

$\sqrt{(-9)^2 + (-13)^2}$

$\sqrt{81 + 169}$

$\sqrt{250} = 15.811$

$A = 15.8$



$\sqrt{250}$

15.811...

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

The midpoint formula

The midpt M of AB with endpts $A(x_1, y_1)$ and $B(x_2, y_2)$ *is:*

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

Example (pg 46 #20)

$H(13, 8)$ $\quad M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$K(-6, -6)$

$(3.5, 1)$

#24 (10, -20)

M $\left(\frac{0+x_2}{2}, \frac{4+y_2}{2}\right)$

(x_1, y_1)

$(0, 4)$

M $(5, -8)$

$2(5) = \left(\frac{x_2}{2}\right)2$

$10 = x_2$

$\frac{4+y_2}{2} = (-8)2$

$4 + y_2 = -16$

$-4 \quad -4$

$y_2 = -20$

$3\left(\frac{x}{3}\right)$

$3\left(\frac{x+1}{3}\right)$

$x + 1$