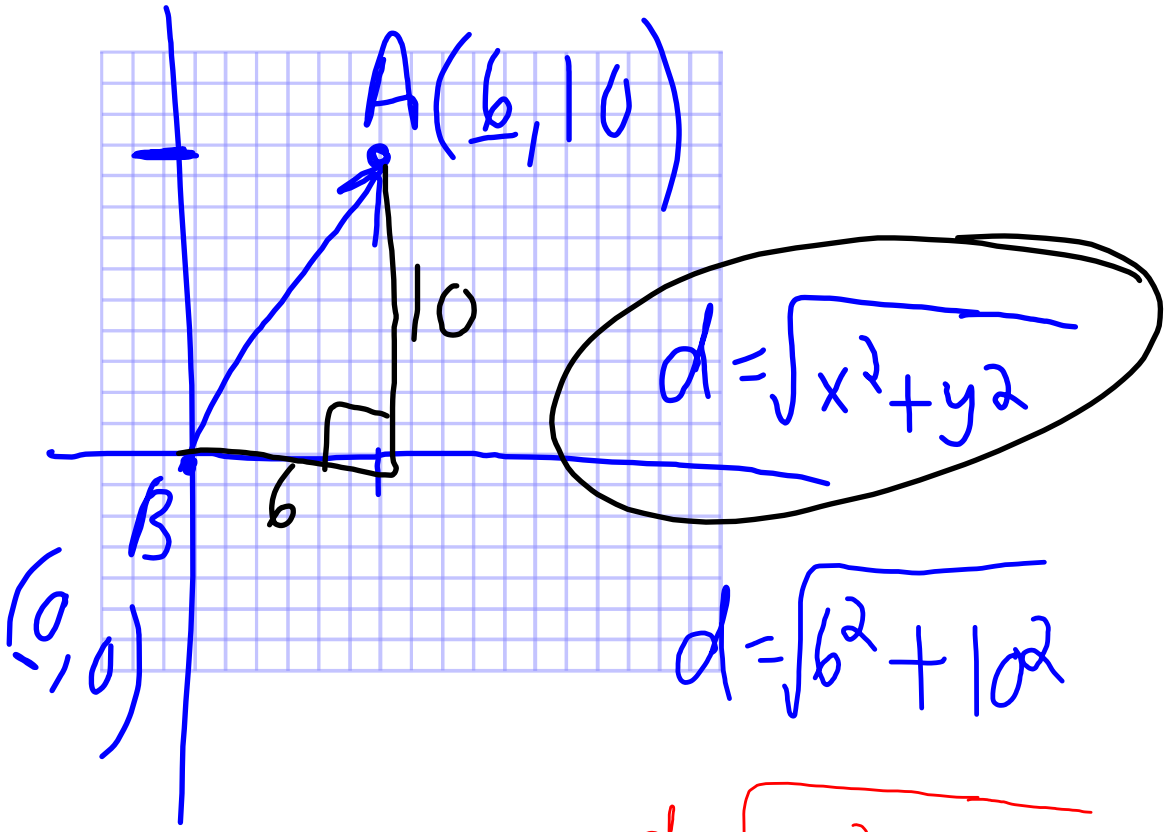
2.5 Distance on the Plane - Part II



$d = \sqrt{x^2 + y^2}$

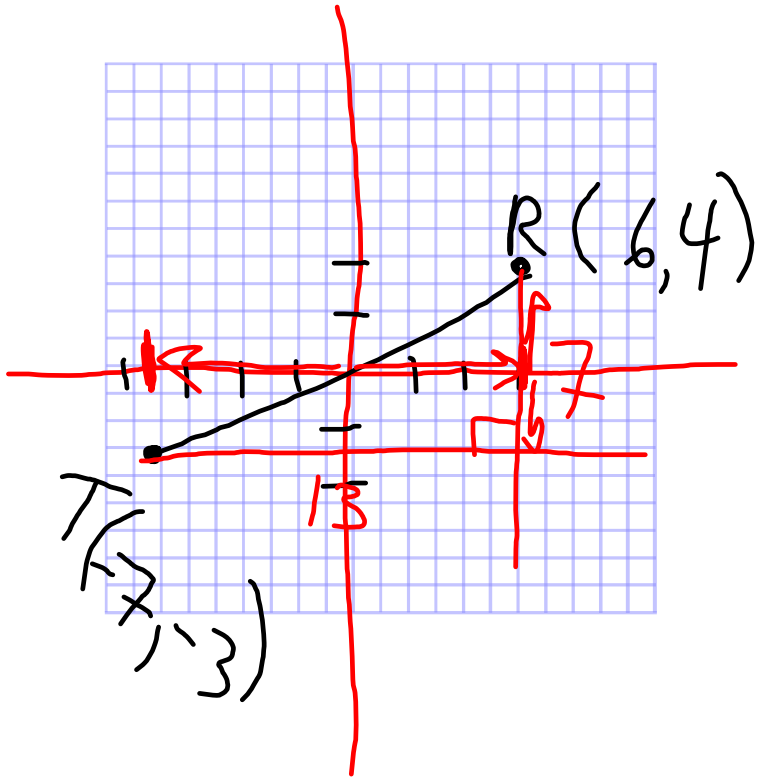
$d = \sqrt{6^2 + 10^2}$

$d = \sqrt{\Delta x^2 + \Delta y^2}$

$d = \sqrt{(6-0)^2 + (10-0)^2}$

$m = \dfrac{y_2 - y_1 = \Delta y}{x_2 - x_1 = \Delta x}$

slope



$$d_{RT} = \sqrt{(6-(-7))^2 + (4-(-3))^2}$$

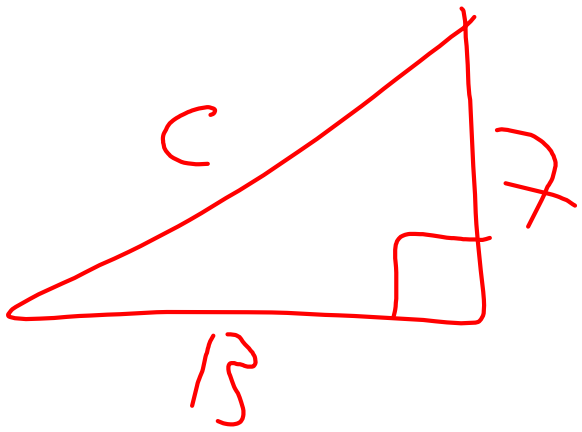
$$d_{RT} = \sqrt{13^2 + 7^2}$$

$$d_{RT} = \sqrt{169 + 49} = \sqrt{218}$$

$$d_{RT} = 14.76\ldots$$

$$d_{RT} \doteq 14.8 \text{ cm}$$

Use pythagorus' formula to solve for length c.

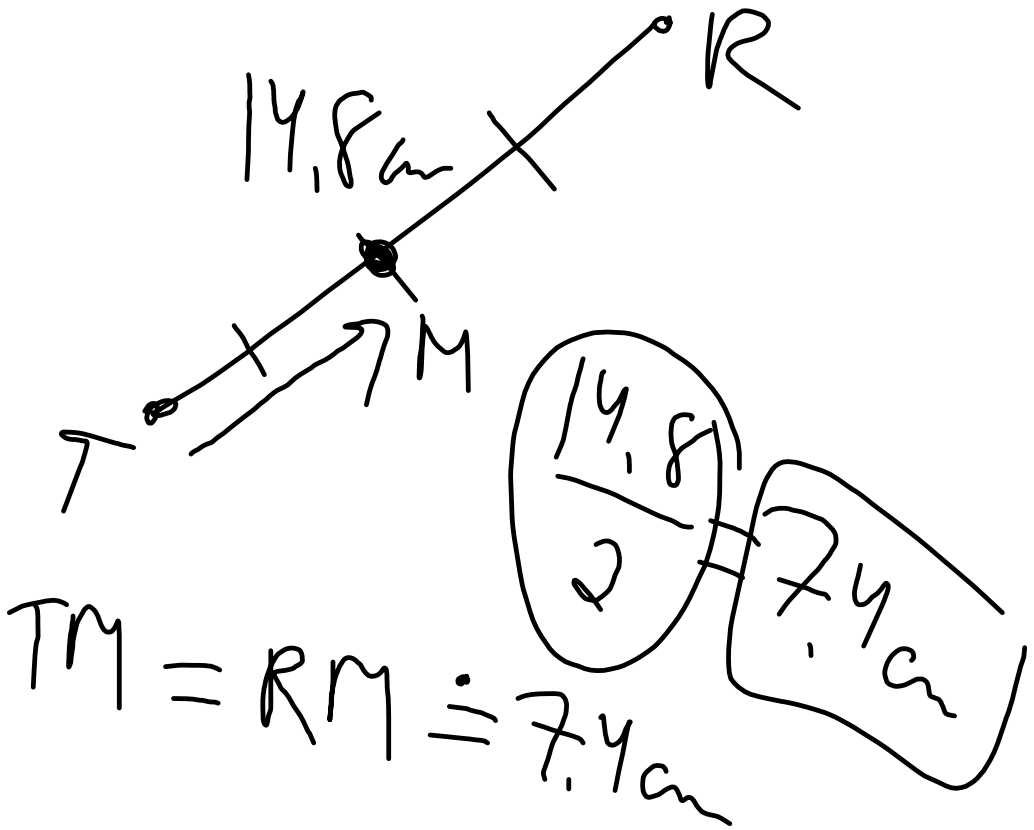


$$c = \sqrt{15^2 + 7^2}$$

$$c = \sqrt{169 + 49}$$

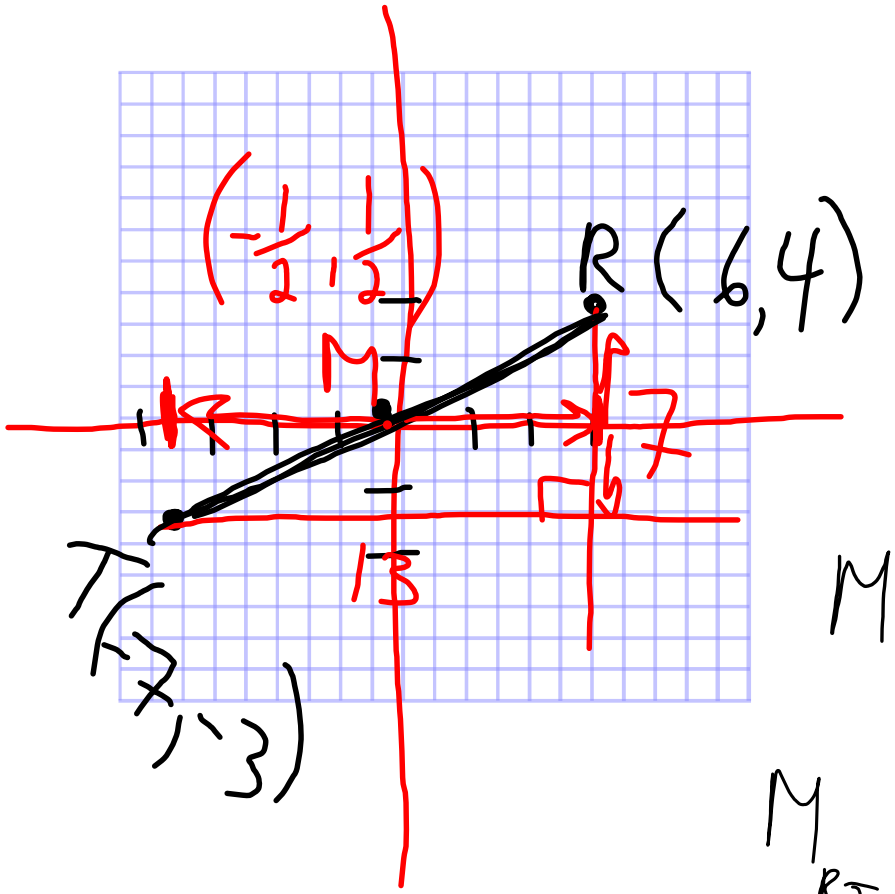
$$c = \sqrt{218} \doteq 14.8$$

2.7 Finding the Midpoint of a Line Segment



Now, lets prove it!

Where is the midpoint?



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

$$M_{RT}\left(\frac{6+(-7)}{2}, \frac{4+(-3)}{2}\right)$$

$$M_{RT}\left(-\frac{1}{2}, \frac{1}{2}\right)$$

$M\left(-\frac{1}{2}, \frac{1}{2}\right)$ $R(6, 4)$

$$d_{MR} = \sqrt{\left(-\frac{1}{2} - 6\right)^2 + \left(\frac{1}{2} - 4\right)^2}$$

$$d_{MR} = \sqrt{(-6.5)^2 + (-3.5)^2}$$

$$d_{MR} = \sqrt{42.25 + 12.25}$$

$$d_{MR} = \sqrt{54.5} = 7.38\ldots$$

$$d_{MR} \doteq 7.4\ \text{cm}$$

$M\left(-\frac{1}{2}, \frac{1}{2}\right)$ $T(-7, -3)$

$$d_{MT} = \sqrt{\left(-\frac{1}{2} - (-7)\right)^2 + \left(\frac{1}{2} - (-3)\right)^2}$$

$$d_{MT} = \sqrt{\left(-\frac{1}{2} + 7\right)^2 + \left(\frac{1}{2} + 3\right)^2}$$

$$d_{MT} = \sqrt{6.5^2 + 3.5^2}$$

$$d_{MT} = \sqrt{42.25 + 12.25}$$

$$d_{MT} = \sqrt{54.5}$$

$$d_{MT} = 7.38\ldots$$

$$d_{MT} = 7.4\ \text{cm}$$

$\therefore MR = MT = 7.4\ \text{cm}$

$\therefore M\left(-\frac{1}{2}, \frac{1}{2}\right)$ is the midpoint.