Functions + Graphs

Coordinate Geometry

Distance Formula

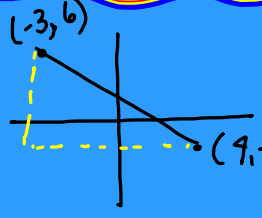
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

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

$$= \sqrt{7^2 + (-8)^2}$$

$$= \sqrt{49 + 64}$$

$$= \sqrt{113} \approx 10.6$$



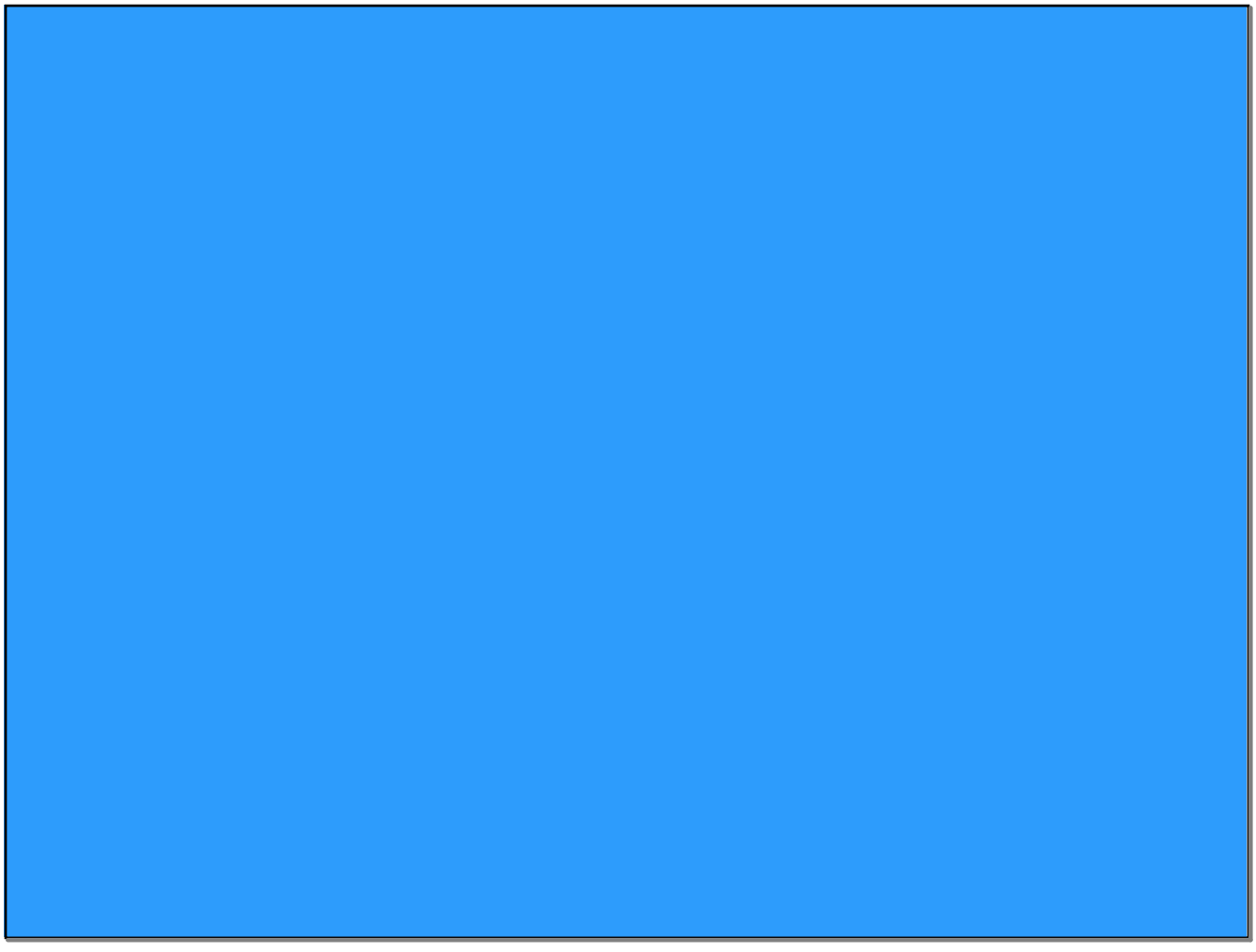
Midpoint Formula

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

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

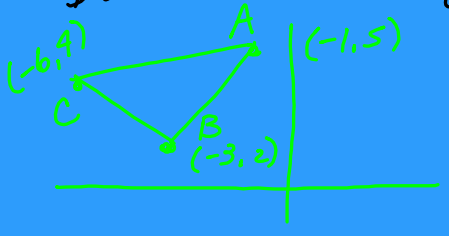
$$\left(\frac{1}{2}, 2 \right)$$

October 20, 2015



Given $(-3,2)$ $(-1,5)$ $(-6,4)$

Does this form a right Δ?



$$AB = \sqrt{(-1+3)^2 + (5-2)^2}$$
$$= \sqrt{2^2 + 3^2} = \sqrt{13}$$

$$BC = \sqrt{(-3-6)^2 + (2-4)^2}$$
$$= \sqrt{3^2 + (-2)^2} = \sqrt{13}$$

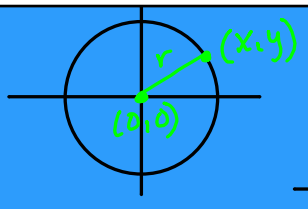
$$AC = \sqrt{(-1+6)^2 + (5-4)^2}$$
$$= \sqrt{5^2 + 1^2}$$
$$= \sqrt{26}$$

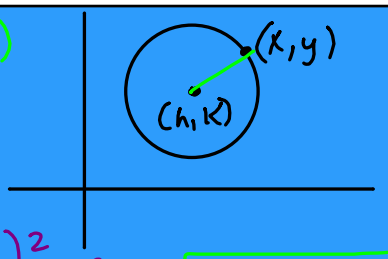
$$(\sqrt{13})^2 + (\sqrt{13})^2 = \sqrt{26}^2$$

$$13 + 13 = 26$$

yes, it's a right $\triangle$.

CIRCLES





Given center $(-4,7)$

radius $= 2\sqrt{3}$

Find eq. of circle.

$$\left(\sqrt{(x-0)^2+(y-0)^2}\right)^2 = (r)^2$$

$$x^2+y^2=r^2$$

$$\sqrt{(x-h)^2+(y-k)^2} = r$$

$$(x-h)^2+(y-k)^2=r^2$$

$$(x--4)^2+(y-7)^2=(2\sqrt{3})^2$$

$$4 \cdot 3$$

$$(x+4)^2+(y-7)^2=12$$

$(x+8)^2+(y-11)^2=48$

Center: $(-8, 11)$

radius: $\sqrt{r^2}=\sqrt{48}$

$\sqrt{16 \cdot 3}$

$r=4\sqrt{3}$

$x^2+y^2-4x+10y-14=0$

$x^2-4x+4+y^2+10y+25=14+4+25$

-2 $+5$

$(x-2)^2+(y+5)^2=43$

Center: $(2, -5)$

radius: $\sqrt{43}$

$$\frac{3x^2}{3}+\frac{3y^2}{3}+\frac{18x}{3}-\frac{36y}{3}-\frac{69}{3}=\frac{0}{3}$$

$$x^2+y^2+6x-12y-23=0$$

$$x^2+6x+9+y^2-12y+36=23+9+36$$

$+3$, -6

$$(x+3)^2+(y-6)^2=68$$

Center: $(-3,6)$

radius: $\sqrt{68}=2\sqrt{17}$

$\sqrt{68}\approx 4.17$