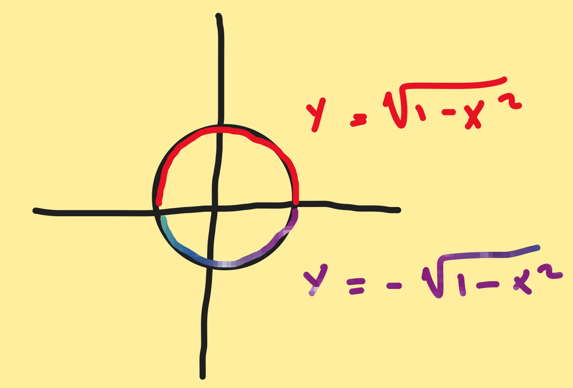
11/10/23

$$(x-x_c)^2+(y-y_c)^2=r^2$$

$$x^2+y^2=1$$

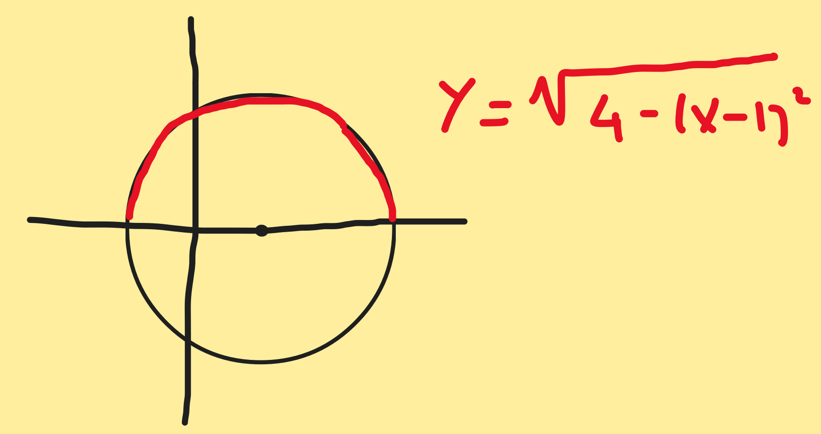
$$y^2=1-x^2$$

$$y=\pm\sqrt{1-x^2} \quad \begin{cases} y=\sqrt{1-x^2} \\ y=-\sqrt{1-x^2}\end{cases}$$




$$(x-1)^2+y^2=4$$

$C=(1,0)$




$$y^2=4-(x-1)^2$$

$$y=\pm\sqrt{4-(x-1)^2}$$

$$4-(x-1)^2\geq 0$$
$$4-(x^2+1-2x)\geq 0$$
$$4-x^2-1+2x\geq 0$$
$$-x^2+2x+3\geq 0$$

vorrei rappresentare la circonferenza con equazione del tipo

$$\begin{cases} x=\dots f(t) \\ y=\dots g(t)\end{cases}$$

posso farlo con una sostituzione!

$$\frac{1}{r^2}\cdot(x-x_c)^2+(y-y_c)^2=r^2\cdot\frac{1}{r^2}$$

$$\frac{(x-x_c)^2}{r^2}+\frac{(y-y_c)^2}{r^2}=1$$

$$\left(\frac{x-x_c}{r}\right)^2+\left(\frac{y-y_c}{r}\right)^2=1$$

$$\cos^2\theta+\sin^2\theta=1$$

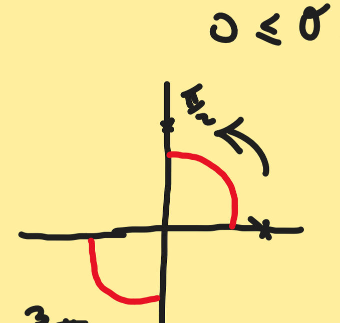
$$0\leq\theta\leq 2\pi$$

$$\begin{cases} \frac{x-x_c}{r}=\cos\theta \\ \frac{y-y_c}{r}=\sin\theta\end{cases} \quad 0\leq\theta\leq 2\pi$$

$$\begin{cases} x-x_c=r\cos\theta \\ y-y_c=r\sin\theta\end{cases} \Rightarrow \begin{cases} x=r\cos\theta+x_c \\ y=r\sin\theta+y_c\end{cases} \quad 0\leq\theta\leq 2\pi$$

equazioni parametriche

$0\leq\theta\leq\frac{\pi}{2}$



$\pi\leq\theta\leq\frac{3}{2}\pi$

con questo metodo posso rappresentare, "arrestando" theta, anche piccoli "spicchi" di circonferenza!

esempio 1

$$\frac{1}{3}\cdot\left(3x^2+3y^2+6x-4\right)=0\cdot\frac{1}{3}$$

$$x^2+y^2+2x-\frac{4}{3}=0$$

$$y^2+(x^2+2x+1)-1-\frac{4}{3}=0$$

$$\frac{3}{7}\cdot\left[y^2+(x+1)^2\right]=\frac{7}{3}\cdot\frac{3}{7}$$

$$\frac{y^2}{7/3}+\frac{(x+1)^2}{7/3}=1$$

$$\left(\frac{y}{\sqrt{7}/\sqrt{3}}\right)^2+\left(\frac{x+1}{\sqrt{7}/\sqrt{3}}\right)^2=1$$

$C=(-1,0)$
$r=\frac{\sqrt{7}}{\sqrt{3}}$

$$\begin{cases} \frac{x+1}{\sqrt{7}/\sqrt{3}}=\cos\theta \\ \frac{y}{\sqrt{7}/\sqrt{3}}=\sin\theta\end{cases} \quad 0\leq\theta\leq 2\pi$$

$$\begin{cases} x+1=\frac{\sqrt{7}}{\sqrt{3}}\cos\theta \\ y=\frac{\sqrt{7}}{\sqrt{3}}\sin\theta\end{cases} \quad \begin{cases} x=\frac{\sqrt{7}}{\sqrt{3}}\cos\theta-1 \\ y=\frac{\sqrt{7}}{\sqrt{3}}\sin\theta\end{cases}$$

esempio 2

$$x^2-2x+y^2=3 \qquad (x-1)^2=x^2-2x+1$$

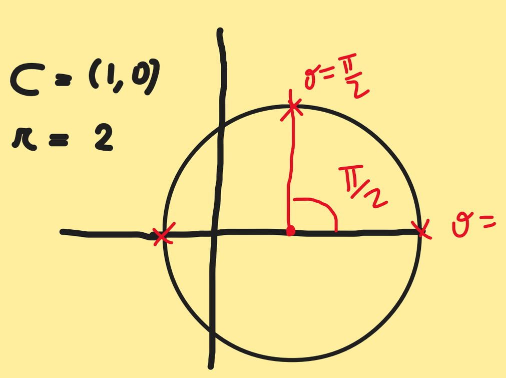
$$(x^2-2x+1)-1+y^2=3$$

$$\frac{1}{4}\left[(x-1)^2+y^2\right]=4\cdot\frac{1}{4}$$

$$\frac{(x-1)^2}{4}+\frac{y^2}{4}=1$$

$$\left(\frac{x-1}{2}\right)^2+\left(\frac{y}{2}\right)^2=1$$

$C=(1,0)$
$r=2$




$$\begin{cases} \frac{x-1}{2}=\cos\theta \\ \frac{y}{2}=\sin\theta\end{cases} \quad \begin{cases} x-1=2\cos\theta \\ y=2\sin\theta\end{cases} \quad \begin{cases} x=\overbrace{2\cos\theta+1}^{r\cos\theta+x_c} \\ y=\underbrace{2\sin\theta}_{r\sin\theta+y_c}\end{cases} \quad 0\leq\theta\leq 2\pi$$

$\theta=0 \rightsquigarrow (2\cdot1+1,\ 0)=(3,0)$
$\theta=\frac{\pi}{2} \rightsquigarrow (2\cdot0+1,\ 1)=(1,2)$