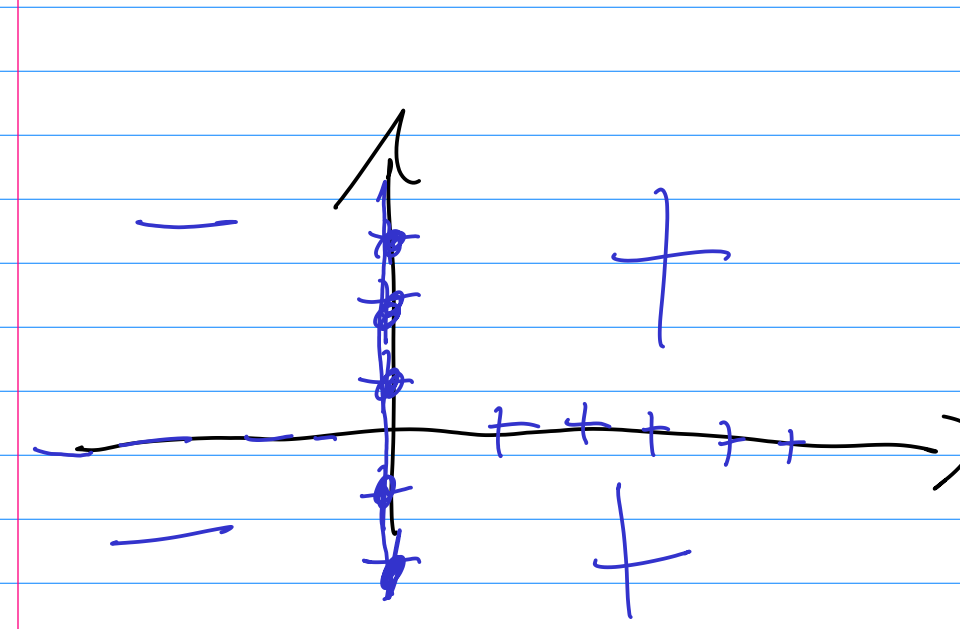
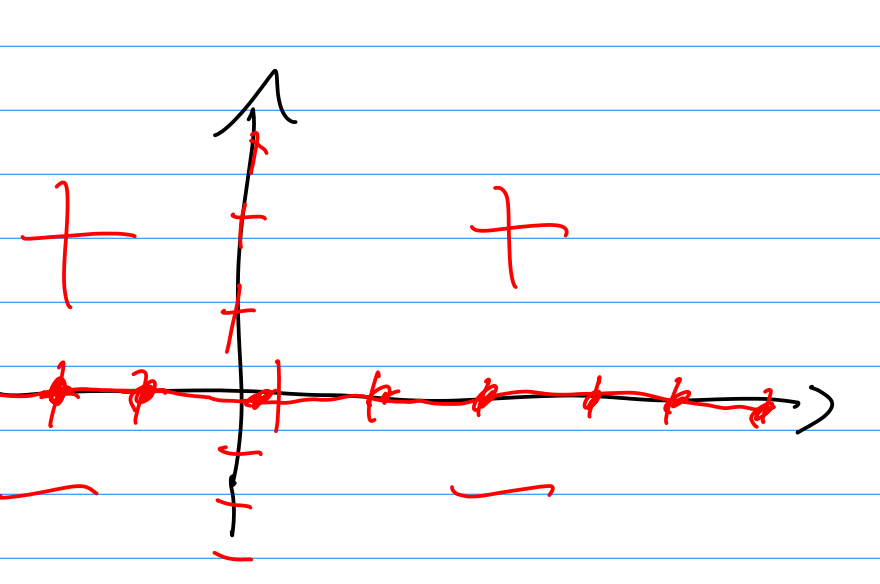
Esercizi

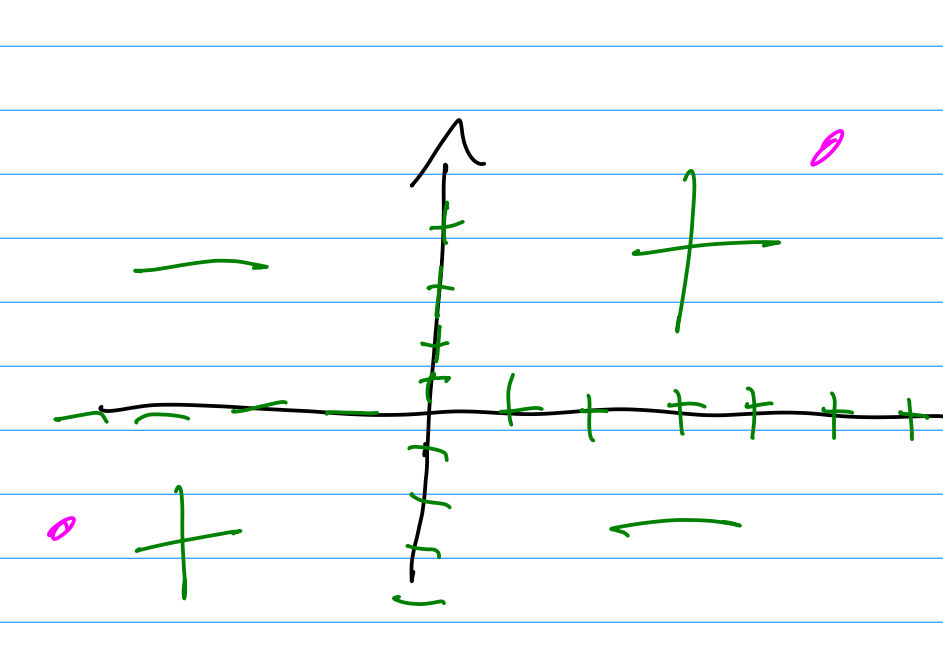
(1) $f(x,y)=\sqrt{xy}$

$xy \geq 0$

$x \geq 0$
$y \geq 0$







$x \geq 0 \wedge y \geq 0$
$\vee$
$x \leq 0 \wedge y \leq 0$

$A: \{(x,y)\in\mathbb{R}^2 : (x\geq 0 \wedge y\geq 0) \vee (x\leq 0 \wedge y\leq 0)\}$

- Interno A

$\mathring{A}=\{(x,y)\in\mathbb{R}^2 : (x>0 \wedge y>0) \vee (x<0 \wedge y<0)\}$

- $\partial A=\{(x,y)\in\mathbb{R}^2 : (x=0 \wedge y\in\mathbb{R}) \vee (x\in\mathbb{R} \wedge y=0)\}$

- $DA=?$ $\quad DA=A$

$A\neq\mathring{A}$ $\quad$ A non è aperto

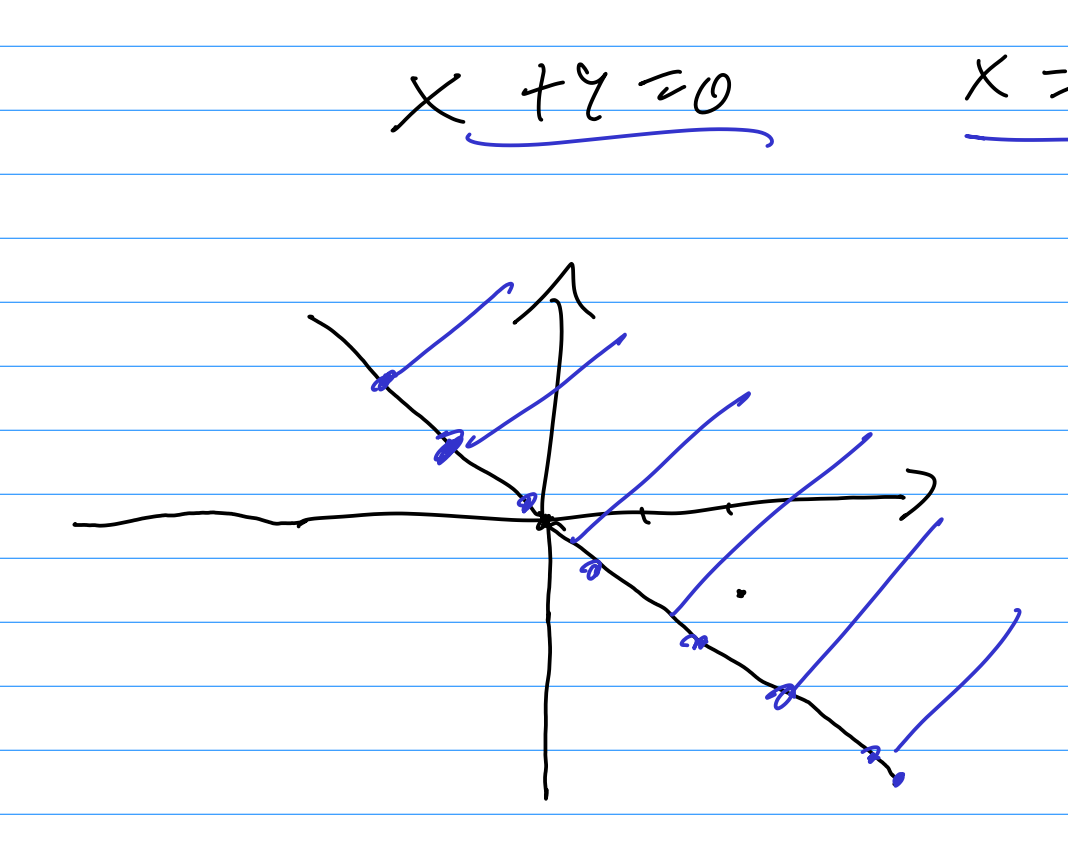
$A\cup\partial A=\bar{A}$ $\quad \bar{A}=A$ $\quad$ A è chiuso

(2) $f(x,y)=\sqrt{\frac{x+y}{2x+y}}$

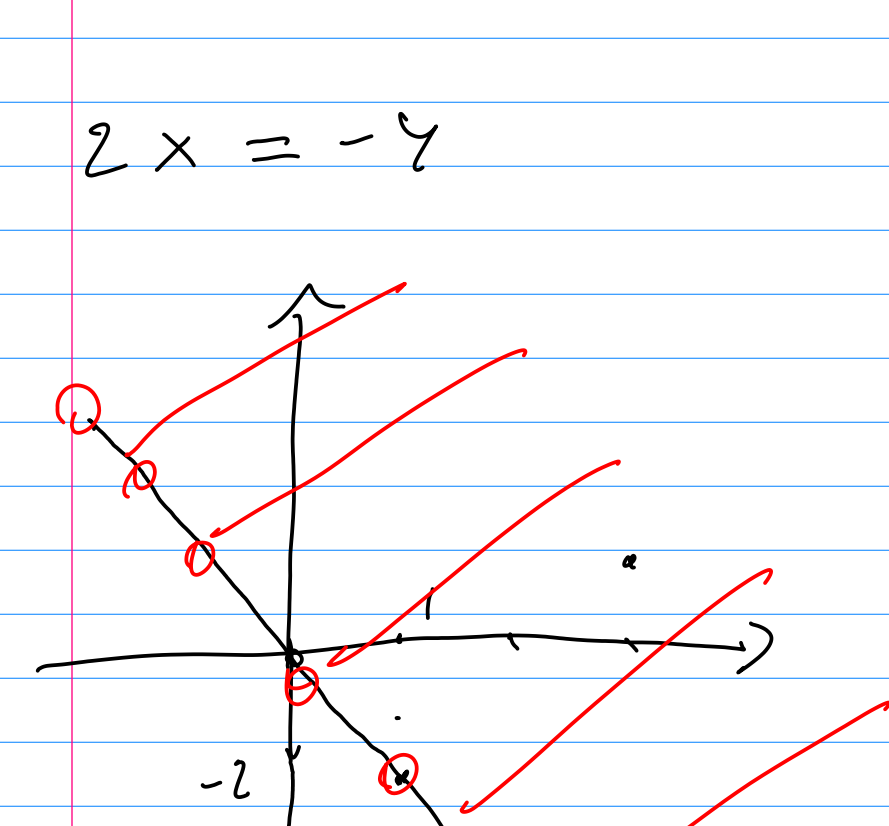
$\frac{x+y}{2x+y}\geq 0$

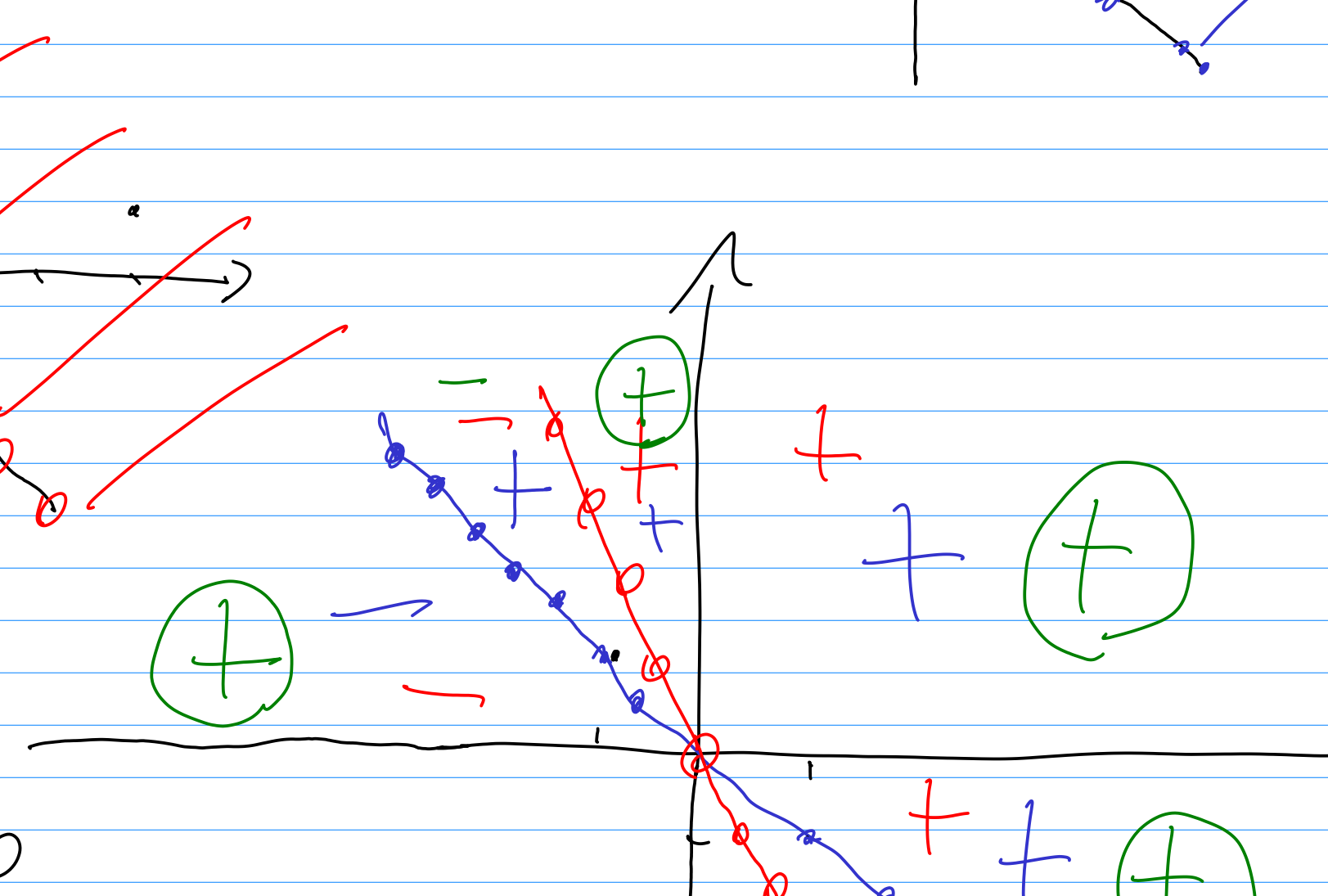
$x+y\geq 0$
$2x+y>0$

$x+y=0 \quad x=-y$



$2x=-y$





$x+y\geq 0$
$2x+y>0$

$A:\{(x,y)\in\mathbb{R}^2 : (x+y\leq 0 \wedge 2x+y<0) \vee (x+y\geq 0 \wedge 2x+y>0)\}$

$y\leq -x \quad y<-2x$
$y\geq -x \quad y>-2x$

- $\mathring{A}=\{(x,y)\in\mathbb{R}^2 : (x+y<0 \wedge 2x+y<0) \vee (x+y>0 \wedge 2x+y>0)\}$

$\partial A=\{(x,y)\in\mathbb{R}^2 : x=-y\}$

$DA \quad \{(x,y)\in\mathbb{R}^2 : (x+y\leq 0 \wedge 2x+y<0) \vee (x+y\geq 0 \wedge 2x+y>0)\}$

(3) $f(x,y)=\sqrt{4-x^2-y^2}$

$4-x^2-y^2\geq 0$

$-x^2-y^2\geq -4$

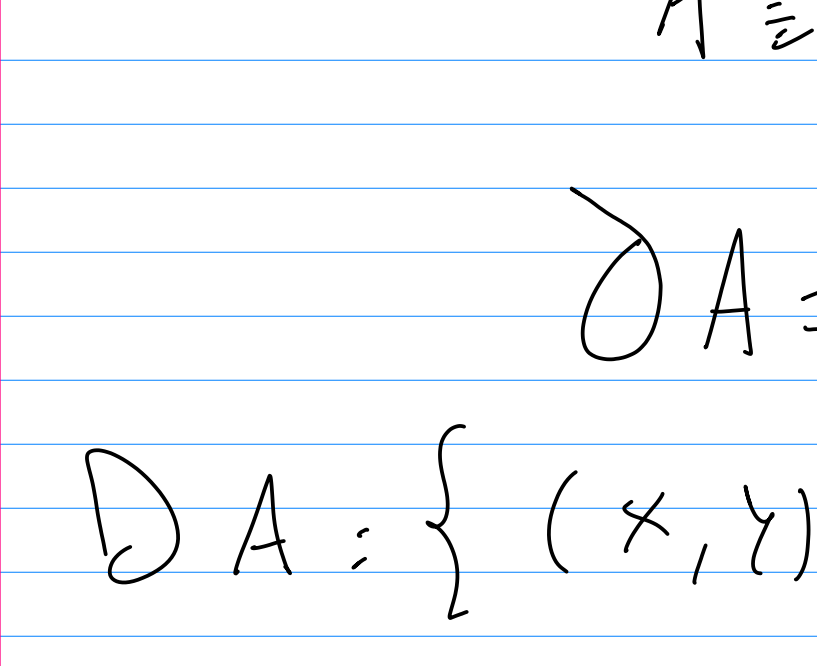
$x^2+y^2\leq 4$ $\quad \gamma=-4$

$x^2+y^2=4$ $\quad x^2+y^2+\alpha x+\beta y+\gamma=0$

$C(0,0)$ $\quad \gamma=0+0-r^2$

$r^2=\gamma \quad r^2=4 \quad r=2$

$A=\{(x,y)\in\mathbb{R}^2 : 4-x^2-y^2\geq 0\}$



$\mathring{A}=\{(x,y)\in\mathbb{R}^2 : 4-x^2-y^2>0\}$

$\partial A=\{(x,y)\in\mathbb{R}^2 : 4-x^2-y^2=0\}$

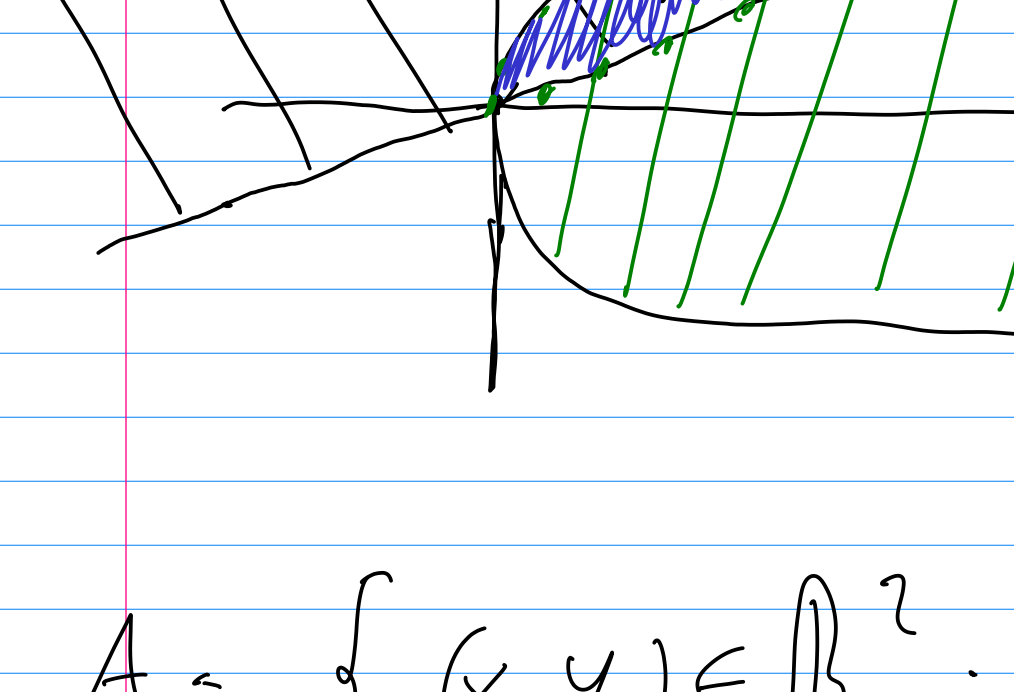
$DA:\{(x,y)\in\mathbb{R}^2 : 4-x^2-y^2\geq 0\}$

(5) $f(x,y)=\sqrt{3y-x}-\sqrt[4]{x-2y^2}$

$3y-x\geq 0 \quad y\geq\frac{x}{3}$
$x-2y^2\geq 0$

$A:\{(x,y)\in\mathbb{R}^2 : 3y\geq x \vee x\geq 2y^2\}$

$y^2=\frac{x}{2}$
$V(-\frac{\Delta}{4a}, -\frac{b}{2a})$
$V(0,0)$



$A:\{(x,y)\in\mathbb{R}^2 : y\geq 0 \vee x\geq 0 \vee 3y\geq x \vee x\geq 2y^2\}$

$\mathring{A}=\{(x,y)\in\mathbb{R}^2 : y>0 \vee x>0 \vee 3y>x \vee x>2y^2\}$

$\partial A=\{y\geq 0 \vee x\geq 0 \vee 3y=x \vee x=2y^2\}$

(6) $f(x,y)=\arccos(x^2+y^2-4)$.

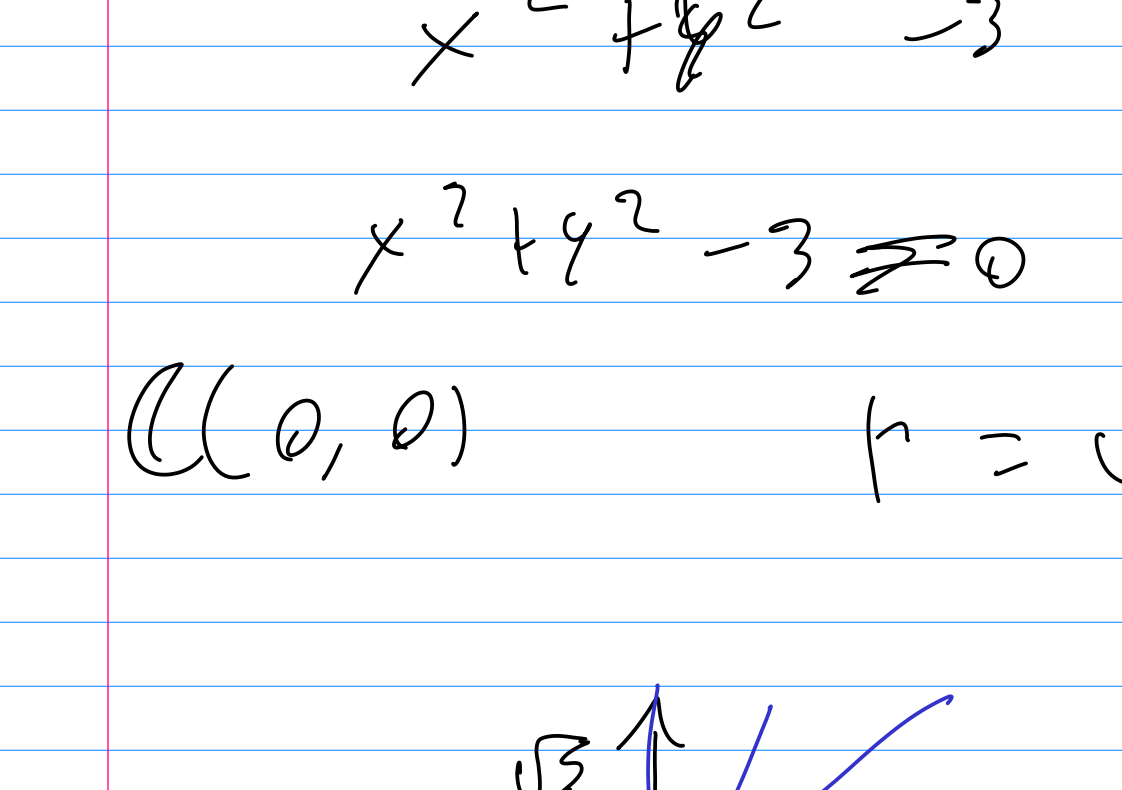
$-1\leq x^2+y^2-4\leq 1$

$x^2+y^2-4\leq 1 \quad x^2+y^2-5\leq 0$

$x^2+y^2+0x+0y+\gamma=0$

$C(0,0) \quad \gamma=0^2+0^2-r^2$

$-5=-r^2 \quad r=\sqrt{5}$

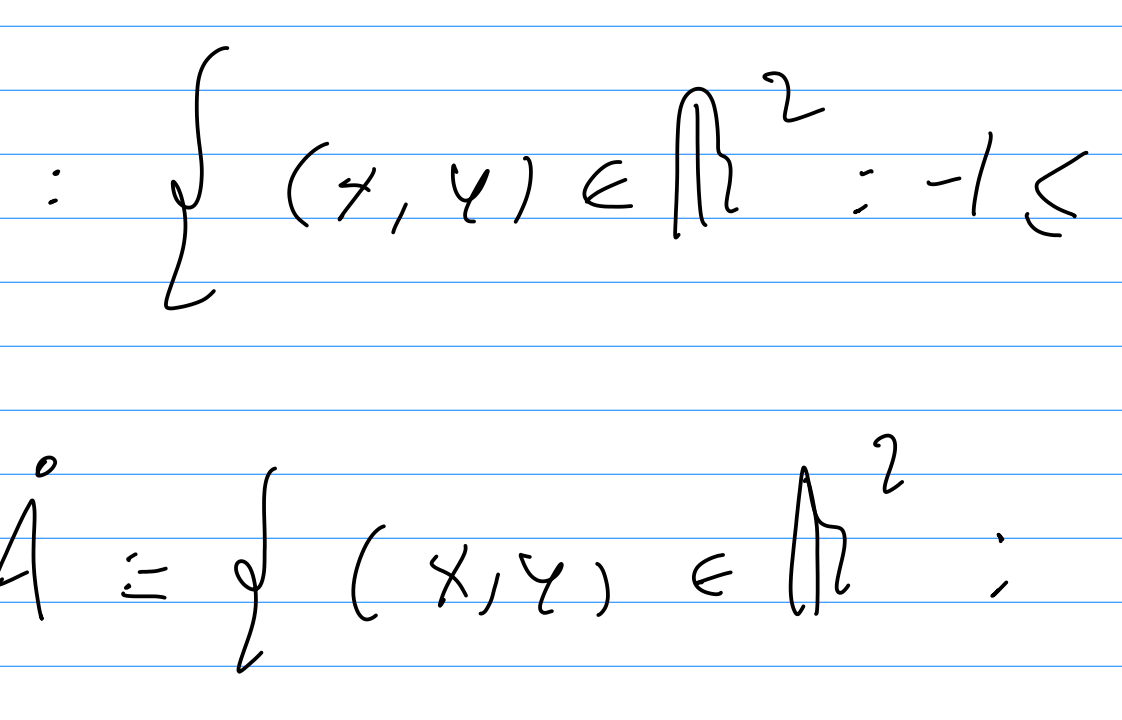


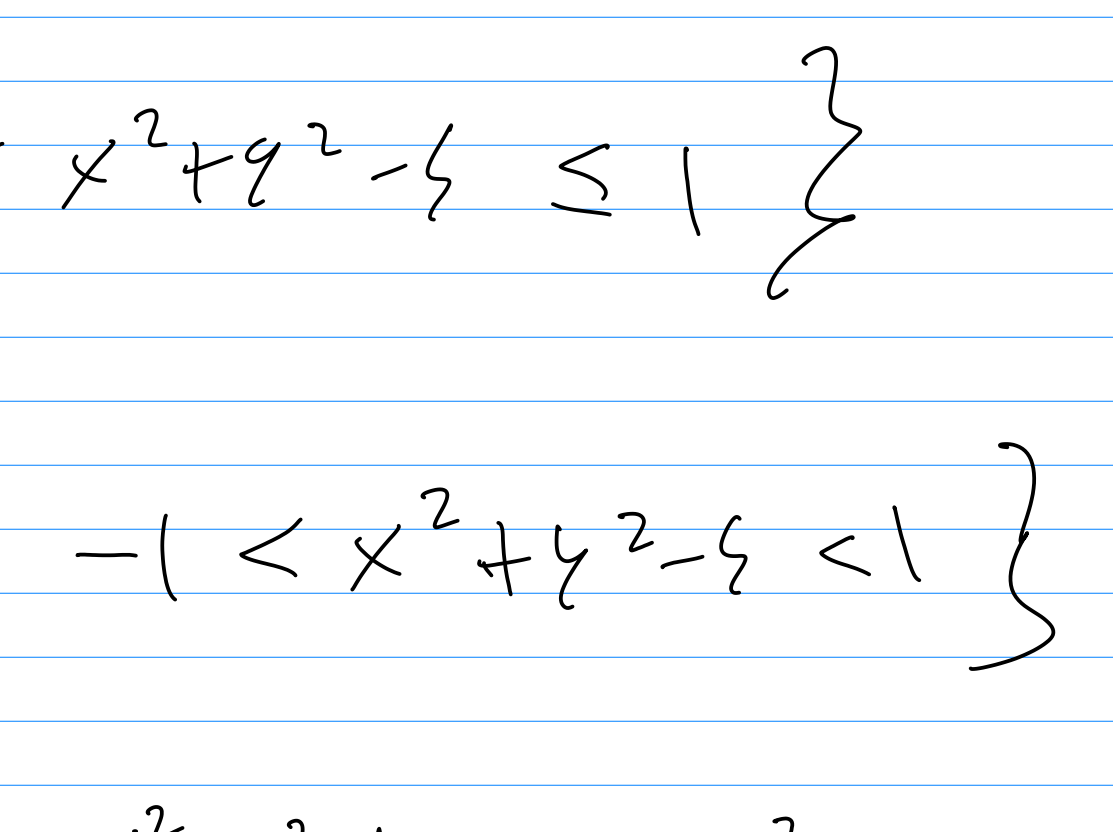
$-1\leq x^2+y^2-4$

$x^2+y^2-3\geq 0$

$x^2+y^2-3=0$

$C(0,0) \quad r=\sqrt{3}$





La circonferenza va compresa

$A:\{(x,y)\in\mathbb{R}^2 : -1\leq x^2+y^2-4\leq 1\}$

$\mathring{A}=\{(x,y)\in\mathbb{R}^2 : -1<x^2+y^2-4<1\}$

$\partial A=\{(x,y)\in\mathbb{R}^2 : x^2+y^2-4=-1 \vee x^2+y^2-4=1\}$

$DA=\{(x,y)\in\mathbb{R}^2 : -1\leq x^2+y^2-4\leq 1\}$