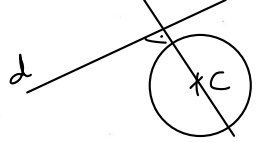
Ex 2.1.5



γ : $x^2+y^2+4x-6y=17 \iff (x+2)^2+(y-3)^2=30$ $\quad C(-2;3)$, $r=\sqrt{30}$

$d' \perp d$: $2x-5y+c=0$

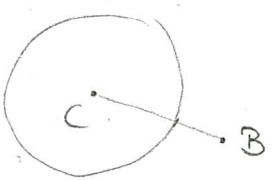
$C \in d'$: $-4-15+c=0 \iff c=+19$

$\Rightarrow$ d' : $2x-5y+19=0$

Ex 2.1.6

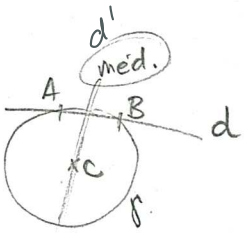
γ : $x^2+y^2-26x+30y=-313 \iff (x-13)^2+(y+15)^2=81$ $\quad C(13;-15)$, $r=9$

$\delta(B;C) = \|\vec{BC}\| = \left\|\begin{pmatrix}10\\-24\end{pmatrix}\right\| = \sqrt{100+576} \cong 26 \quad (>9)$



$\Rightarrow$ $\delta(B;\gamma) = 26-9 = 17$ u

Ex 2.1.7



γ : $(x-2)^2+(y+1)^2=25$ $\quad C(2;-1)$ $\quad r=5$

$d \cap \gamma$: $\begin{cases} x^2+y^2-4x+2y-20=0 \\ 2x+y=13 \end{cases} \iff y=-2x+13$

subst. 1e $\Rightarrow$

$x^2+(-2x+13)^2-4x+2(-2x+13)-20=0$

$x^2+4x^2-52x+169-4x-4x+26-20=0$

$5x^2-60x+175=0$

$x^2-12x+35=0$

$(x-5)(x-7)=0$

$x = \begin{cases} 5 \Rightarrow y=-10+13=3 \Rightarrow A(5;3) \\ 7 \Rightarrow y=-14+13=-1 \Rightarrow B(7;-1) \end{cases} \Rightarrow M(6;1)$

inutile !

médiatrice passant par C !

$x-2y+c=0$

$C(2;-1) \in$ méd : $\dots c=-4$

$\Rightarrow$ d' : $x-2y-4=0$

$\Rightarrow$ $d' = m_{AB} \perp d$: $x-2y+c=0$

$M \in d'$: $6-2+c=0 \iff c=-4$

$\Rightarrow$ d' : $x-2y-4=0$

Ex 2.1.9

$C \in a : 4x - 5y - 3 = 0$

$b : 2x - 3y - 10 = 0$

$c : 3x - 2y + 5 = 0$

γ tgt à b et c

$\Rightarrow C \in$ biss. de b et c.

* biss. de b et c :

$$\frac{2x-3y-10}{\sqrt{4+9}} = \pm \frac{3x-2y+5}{\sqrt{9+4}} \quad | \cdot \sqrt{13}$$

$$\Leftrightarrow 2x - 3y - 10 = \pm(3x - 2y + 5)$$

$$\Leftrightarrow \begin{cases} 2x-3y-10 = 3x-2y+5 \Leftrightarrow x+y+15=0 : b_1 \\ 2x-3y-10 = -3x+2y-5 \Leftrightarrow 5x-5y-5=0 \Leftrightarrow x-y-1=0 : b_2 \end{cases}$$

* $\gamma_1 : \{C_1\} = a \cap b_1 \Leftrightarrow \begin{cases} 4x-5y=3 \\ x+y=-15 \end{cases} \begin{matrix} | 1 \\ | 5 \end{matrix} \Rightarrow +$

$$\begin{array}{r} 4x-5y=3 \\ 5x+5y=-75 \\ \hline 9x = -72 \\ x = -8 \end{array}$$

$\Rightarrow y = -15 + 8 = -7$

$\Rightarrow C_1(-8;-7)$

$r = \delta(C_1; b) = \frac{|-16+21-10|}{\sqrt{4+9}} = \frac{5}{\sqrt{13}}$ $\Rightarrow \gamma_1 : (x+8)^2 + (y+7)^2 = \frac{25}{13}$

* $\gamma_2 : \{C_2\} = a \cap b_2 \Leftrightarrow \begin{cases} 4x-5y=3 \\ x-y=1 \end{cases} \begin{matrix} | 1 \\ | -5 \end{matrix} \Rightarrow$

$$\begin{array}{r} 4x-5y=3 \\ -5x+5y=-5 \\ \hline -x = -2 \\ x = 2 \end{array} \Rightarrow y = 2-1 = 1$$

$\Rightarrow C_2(2;1)$

$r = \delta(C_2; b) = \frac{|4-3-10|}{\sqrt{13}} = \frac{9}{\sqrt{13}}$ $\Rightarrow \gamma_2 : (x-2)^2 + (y-1)^2 = \frac{81}{13}$