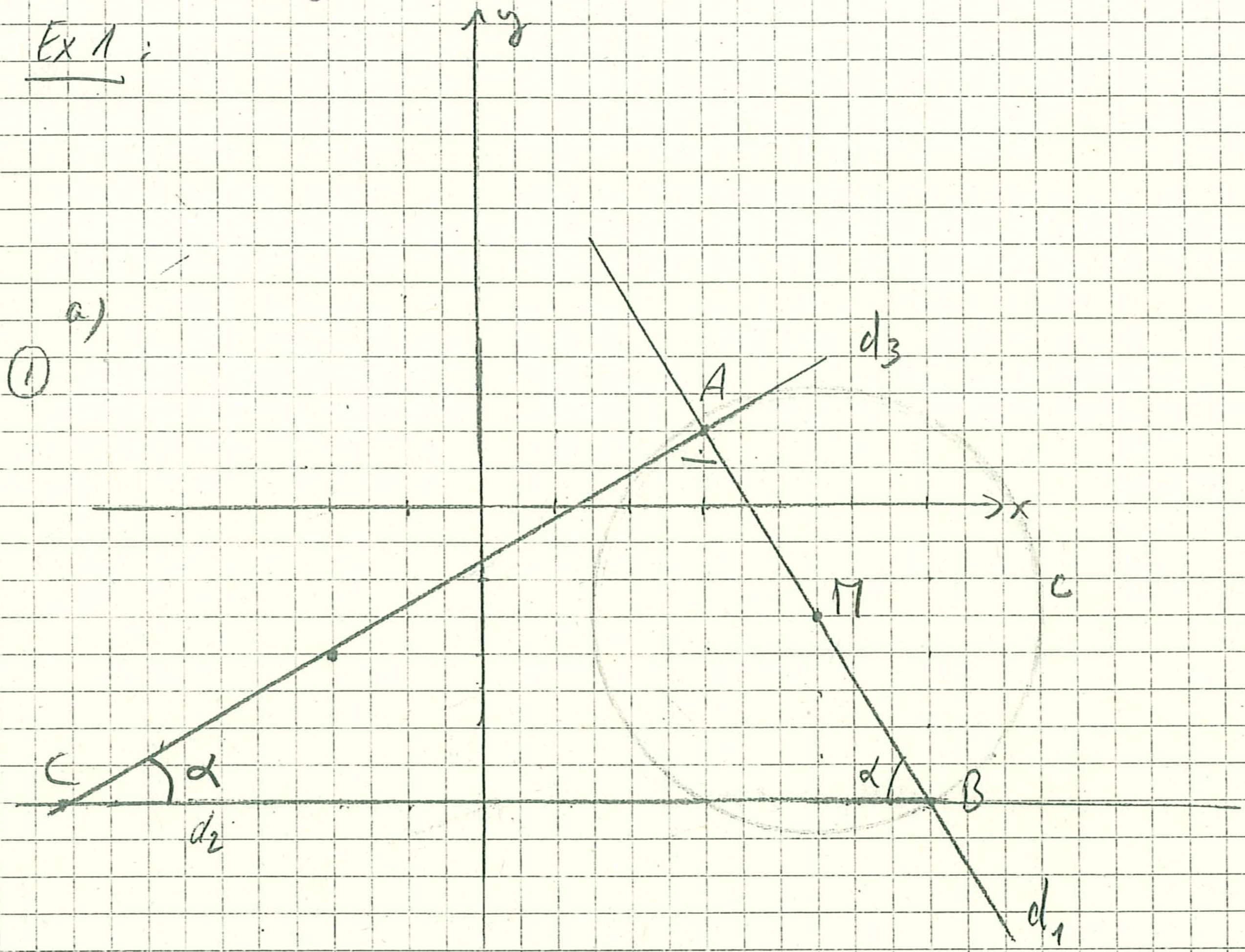
Math 1N Corrigé travail 90' n°6

[47]

Ex 1 :

a)

(1)



(3) b) $d_{AB} = \sqrt{(6-3)^2+(-4-1)^2} = \sqrt{9+25} = \sqrt{34}$

c) pente de d_1: $p_{d_1} = \frac{1-(-4)}{3-6} = \frac{5}{-3} = -\frac{5}{3}$

(3) $y = -\frac{5}{3}x + q$

$A(3;1) \in d_1 \Leftrightarrow 1 = -\frac{5}{3} \cdot 3 + q$

(3) $\Leftrightarrow q = 6$

(4) éq. de d_1: $\left[y = -\frac{5}{3}x + 6 \right]$

(3) d) éq. de d_2 : $[y = -4]$

(3) e) pente de $d_3 = \frac{-1}{p_{d_1}} = \frac{3}{5}$

$y = \frac{3}{5}x + q$

(3) $A(3;1) \in d_3 \Leftrightarrow 1 = \frac{3}{5} \cdot 3 + q$

(1) $\Leftrightarrow q = -\frac{4}{5}$

éq de d_3 : $\left[y = \frac{3}{5}x - \frac{4}{5} \right]$

f) equation de d_3 : $y = \frac{3}{5}x - \frac{4}{5} \Leftrightarrow 5y = 3x - 4$

$\Leftrightarrow 3x - 5y = 4$

si $y = -2$: $3x + 10 = 4$

$3x = -6$

$x = -2$

3

donc (par exemple) : $D(-2 ; -2)$

g) 2

h) d_3 : $y = \frac{3}{5}x - \frac{4}{5}$

d_2 : $y = -4$

intersection : $\frac{3}{5}x - \frac{4}{5} = -4$

$\Leftrightarrow 3x - 4 = -20$

$\Leftrightarrow 3x = -16$

$\Leftrightarrow x = -16/3$

1.5

4

$C\left(-\frac{16}{3} ; -4\right)$

i) $d_{AB} + d_{AC} \overset{?}{=} d_{BC}$

$(6-3)^2 + (-4-1)^2 + \left(3 - \left(-\frac{16}{3}\right)\right)^2 + (1-(-4))^2 \overset{?}{=} \left(6 - \left(-\frac{16}{3}\right)\right)^2 + (-4-(-4))^2$

$\Leftrightarrow 9 + 25 + \left(\frac{25}{3}\right)^2 + 25 \overset{?}{=} \left(\frac{34}{3}\right)^2 + 0$

$\Leftrightarrow 59 + \frac{625}{9} \overset{?}{=} \frac{1156}{9}$

$\frac{531 + 625}{9} \overset{?}{=} \frac{1156}{9}$

$\frac{1156}{9} \overset{?}{=} \frac{1156}{9}$ ✓

5

j) rayon $= \frac{d_{AB}}{2} = \frac{\sqrt{34}}{2}$ (3)

centre $A(3;1)$

éq. de c : $(x-3)^2 + (y-1)^2 = \left(\frac{\sqrt{34}}{2}\right)^2$

$(x-3)^2 + (y-1)^2 = \frac{34}{4} = \frac{17}{2}$ (3)

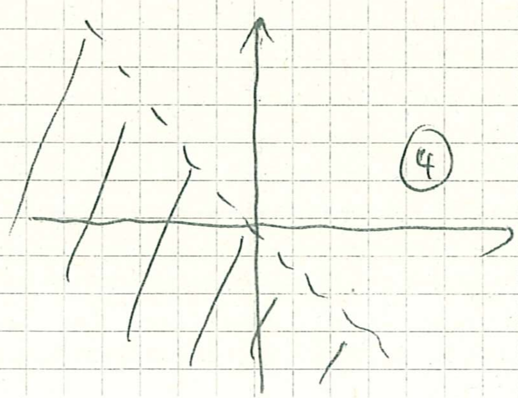
repr. graph. de c : (2)

k) $\alpha = \angle BCA$

$\sin(\alpha) = \frac{\overline{AB}}{\overline{BC}}$

$\alpha = \sin^{-1}\left(\frac{\overline{AB}}{\overline{BC}}\right) = \sin^{-1}\left(\frac{\sqrt{34}}{14/3+6}\right) \simeq 31°$

ex2:



(4)

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Ex3 : $x^2+y^2+4x-6=0$

$\Leftrightarrow (x^2+4x)+y^2-6=0$

$\Leftrightarrow (x^2+4x+4)+y^2-6-4=0$

$\Leftrightarrow (x+2)^2+(y-0)^2=10$ 6

centre $C(-2;0)$

rayon $r=\sqrt{10}$ 2

/9

Ex4 :

a) o.o. = 3

$p=\frac{1}{2}$ 2

b) $y=a(x+2)^2+1$ 3

$(0;-1)\in c \Leftrightarrow -1=a(0+2)^2+1$

$\Leftrightarrow -1=4a+1$

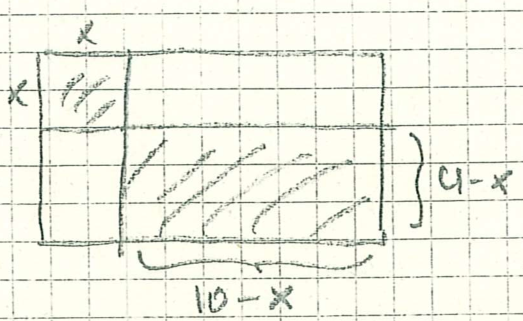
$\Leftrightarrow 4a=-2$

$\Leftrightarrow a=-1/2$ 3

éq. de p : $y=-\frac{1}{2}(x+2)^2+1$ 1

(1/17)

Ex 5



$y = S = x^2 + (10-x)(4-x)$ (4)

$= x^2 + 40 - 4x - 10x + x^2$

$= 2x^2 - 14x + 40$

int Oy : $x=0 \Rightarrow y = 40$

int Ox : $2x^2 - 14x + 40 = 0$

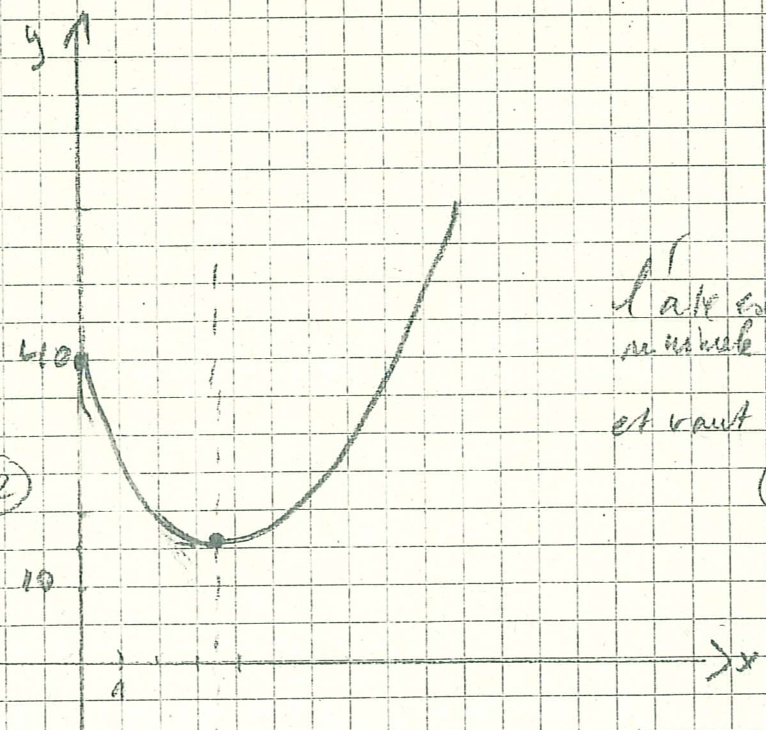
(4) $\Delta = (-14)^2 - 4 \cdot 2 \cdot 40$

$= 196 - 320 < 0$

$S = \emptyset$

axe : $x = \frac{14}{4} = \frac{7}{2} = 3,5$

(4) sommet : $S\left(\frac{7}{2} ; \frac{-\Delta}{4a}\right) = S\left(3,5 ; \frac{124}{8}\right) = S(3,5 ; 15,5$



(2)

l'aire est minimale pour $x = 3,5$ et vaut alors 15,5

(3)