95 Formule de Bainbridge

$$v = \frac{1}{4} L (3f-4)$$

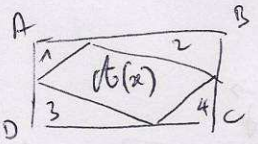
1) $v = \frac{1}{4} L (3f-4)$

$\Leftrightarrow 3f - 4 = \frac{4v}{L} \Leftrightarrow 3f = \frac{4v}{L} + 4 = 4\left(\frac{v}{L} + 1\right) \Leftrightarrow f = \frac{4}{3}\left(\frac{v}{L} + 1\right)$

2) $f = \frac{4}{3}\left(\frac{145}{15} + 1\right) = \frac{4}{3}\left(\frac{29}{3} + 1\right) = \frac{4}{3}\left(\frac{32}{3}\right) = \frac{128}{9} \simeq 14,22$

3) $L = \frac{4v}{(3f-4)}$ $\quad L = \frac{4 \times 70 \times 10^5 : 3600}{(3 \times 10 - 4)} = \frac{4 \times 7 \times 10^6}{26 \times 3600} = 299 \text{ cm} \simeq 3 \text{ m}$

83



1) $\mathcal{A}(x) = \text{Aire}(ABCD) - A_1 - A_2 - A_3 - A_4$

$= (7 \times 3) - \frac{x(3-x)}{2} - \frac{x(7-x)}{2} - \frac{x(7-x)}{2} - \frac{x(3-x)}{2}$

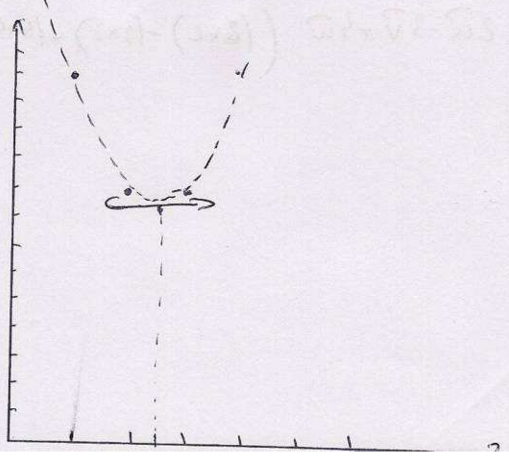
$= 21 - x(3-x) - x(7-x)$

$= 21 - 3x + x^2 - 7x + x^2 = 2x^2 - 10x + 21$

2) $\mathcal{A}(x) = 2\left((x-2,5)^2 + 4,25\right) = 2\left(x^2 - 5x + (2,5)^2 + 4,25\right)$

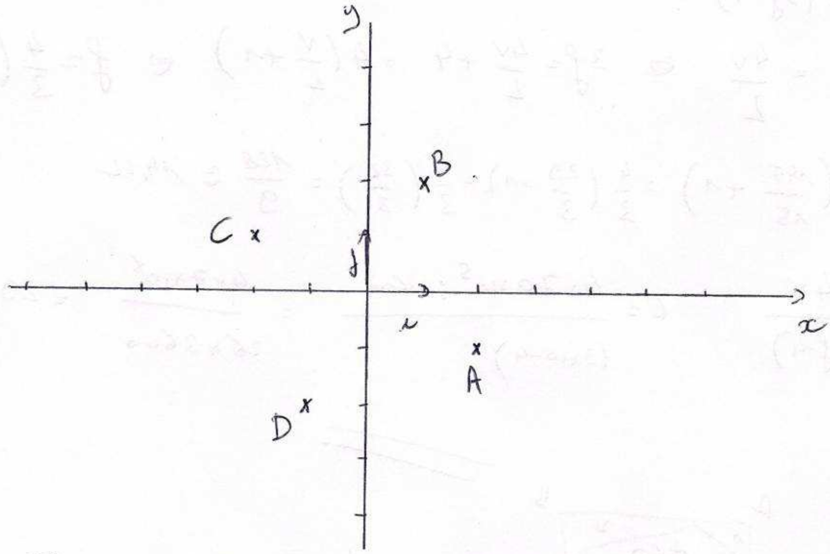
$= 2(x^2 - 5x + 10,5) = 2x^2 - 10x + 21$ cqfd

3) et 4)
L'aire de $\mathcal{A}(x)$ est minimale pour $x = 2,5$



18 $\vec{OA} = 2\vec{i} - \vec{j}$ $\vec{OB} = \vec{i} + 2\vec{j}$

$\vec{OC} = -2\vec{i} + \vec{j}$ $\vec{OD} = -\vec{i} - 2\vec{j}$



$\vec{AB} = \vec{OB} - \vec{OA} = \vec{i} + 2\vec{j} - 2\vec{i} + \vec{j} = -\vec{i} + 3\vec{j}$

$\vec{DC} = \vec{OC} - \vec{OD} = -2\vec{i} + \vec{j} + \vec{i} + 2\vec{j} = -\vec{i} + 3\vec{j} = \vec{AB}$ donc ABCD est un parallélogramme.

25 $\vec{u}(2;4)$ $\vec{v}(3;-1)$ $\vec{w}(4;-4)$

$\vec{u} + \vec{v} + \vec{w}$ $(2+3+4 \ ; 4-1-4) = (9 ; -1)$

$\vec{u} - \vec{v} - \vec{w}$ $(2-3-4 \ ; 4+1+4) = (-5 ; 9)$

$2\vec{u} - 3\vec{v} + 4\vec{w}$ $((2\times2)-(3\times3)+(4\times4) \ ; (2\times4)+(3\times1)-(4\times4)) = (11 ; -5)$