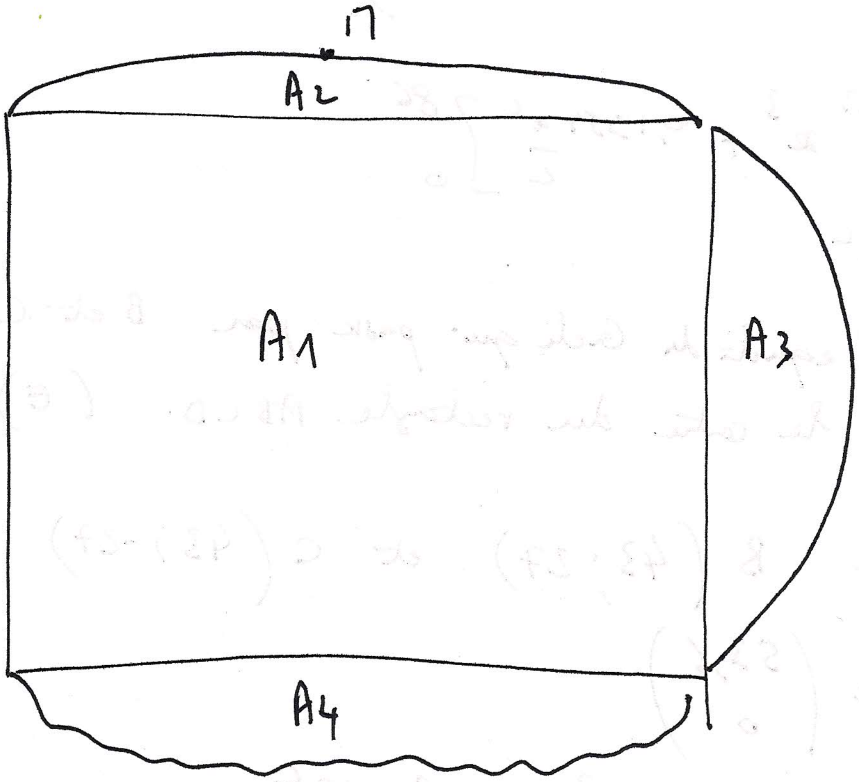
Superficie du Terrain ci-dessous.



$A = A_1 + A_2 + A_3 + A_4.$

1) $A_1 = \cancel{44485^2 x}\ 54 \times 86 = 4644\ m^2$

2) A_2 : on assimile la courbe passant par M à une parabole. d'équation

$y = ax^2 + bx + c$ $\quad f(0) = 0$

$f(43) = 4,20$

$f(86) = 0$

Donc $\begin{cases} c = 0 \\ a \times 43^2 + b \times 43 = 4,20 \\ 86^2 a + 86 b = 0 \end{cases} \Leftrightarrow \begin{cases} b = -86a \\ 43^2 a - 86 \times 43 a = 4,20 \end{cases} \Leftrightarrow \begin{cases} a = \dfrac{4,2}{43^2 - 86 \times 43} \\ \quad = -2,27 \times 10^{-3} \\ b = 0,19534 \end{cases}$

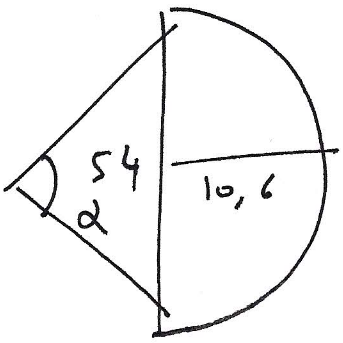
Donc $y = -2,27 \times 10^{-3} x^2 + 0,19534\, x$

Donc $A_2 = \int_0^{86} (-2,27\times10^{-3} x^2 + 0,1954x)\,dx$

$= \left[\frac{-2,27\times10^{-3}}{3} x^3 + 0,1954 \frac{x^2}{2}\right]_0^{86}$

$= \underline{\underline{241,30\ m^2}}$

3)



$\ell = 54$

$b = 10,6$

$\ell = 2\times\sqrt{b\times(2r-b)}$

$\ell^2 = 4\times b\times(2r-b)$

$2r - b = \frac{\ell^2}{4b} \Leftrightarrow r = \left(\frac{\ell^2}{4b} + b\right)\times\frac{1}{2}$

$\Leftrightarrow r = 39,69$ m.

~~Donc surface A3~~ = $\alpha = \mathrm{Arctan}\left(\frac{2b}{\ell}\right)\times 4 = 4\times \mathrm{Arctan}\left(\frac{2b}{\ell}\right)$

$= 4\times \mathrm{Arctan}\left(\frac{21,2}{54}\right)$

$= 85,73° = 1,4964$ rad.

Donc $A_3 = \pi \times D^2 \times \alpha/1440 - \left(\frac{\ell\times(r-b)}{2}\right)$

$= \pi \times (39,69\times2)^2 \times \frac{85,73}{1440} - \left(\frac{54\times(39,69-10,6)}{2}\right)$

$= \underline{\underline{393,11\ m^2}}$

4) Pour calcul A_4, il nous faut utiliser la méthode de Simpson.

$A_4 = \frac{86}{10} \times \cancel{\left(\frac{h_1+h_{10}}{2}\right) + h_2 + \ldots}\ 8,6 \times \left(\left(\frac{h_1+h_{11}}{2}\right) + h_2+h_3+h_4+h_5+h_6+h_7 + h_8+h_9+h_{10}\right)$

$A_4 = 8,6\left(\frac{0+0}{2} + 3,40 + 4,90 + 5,80 + 6,40 + 7,20 + 8,20 + 7,40 + 6,20 + 5\right)$

$= 8,6 \times 54,5 = 468,7\ m^2$