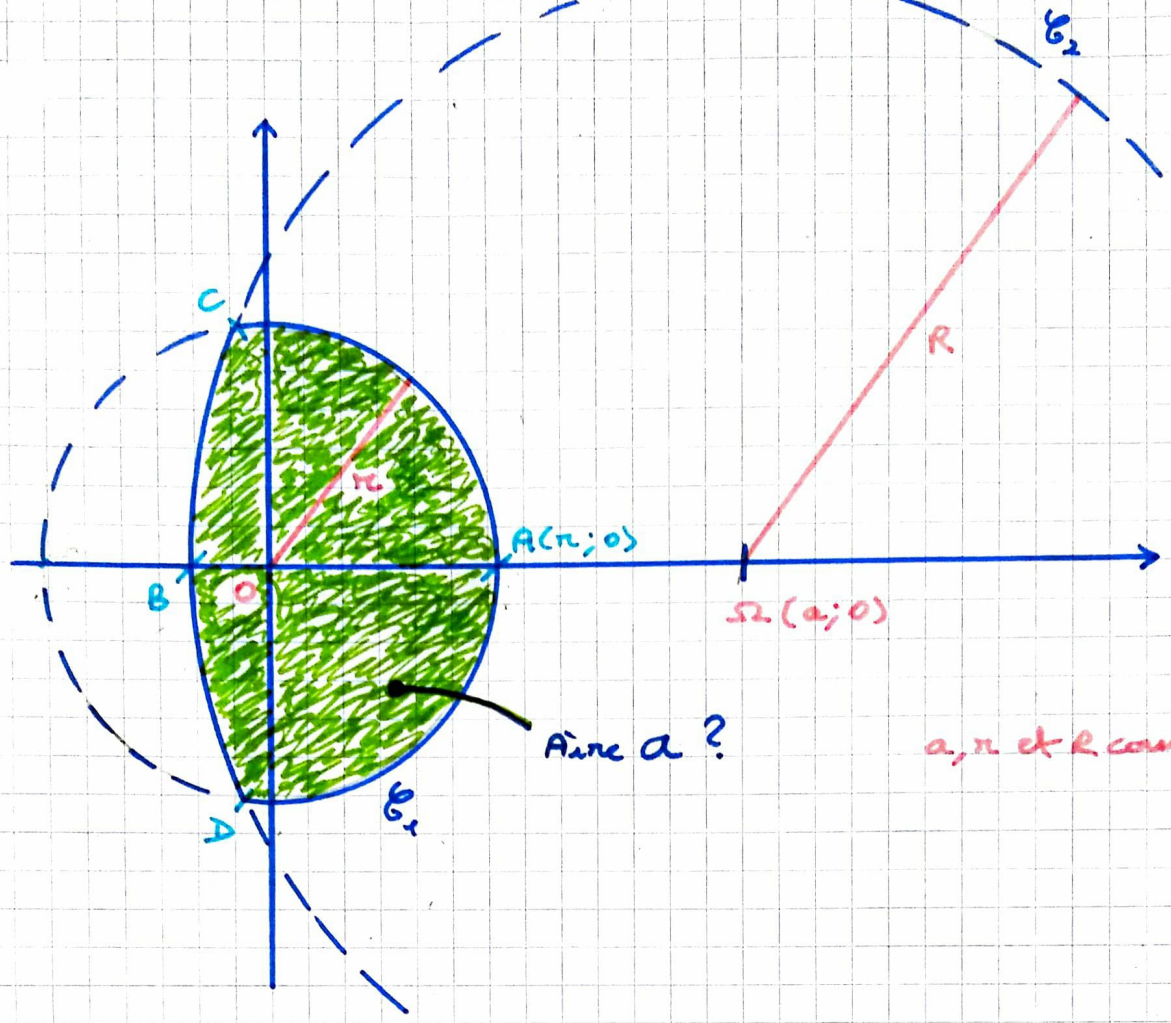
# Bout de Disque




a, r et R connus.

- $a = 2\left( \underbrace{\int_{x_B}^{x_C} \sqrt{R^2 - (x-a)^2}\, dx}_{I_1} + \underbrace{\int_{x_C}^{x_A} \sqrt{r^2 - x^2}\, dx}_{I_2} \right)$

- $x_B = -R + a$

- $x_C^2 + y_C^2 = r^2$ et $(x_C - a)^2 + y_C^2 = R^2$

  Donc,

  $r^2 - 2a x_C + a^2 = R^2$

  $x_C = \frac{1}{2a}\left(r^2 + a^2 - R^2\right)$

- $\int_\alpha^\beta \sqrt{R^2 - (x-a)^2}\, dx$

  $x \leftarrow x - a$

$= \int_{\alpha'}^{\beta'} \sqrt{R^2 - x^2}\, dx$

  $x = Rt$

$= \int_{\alpha''}^{\beta''} \sqrt{1 - t^2}\, dt \times R^2$

... Du très classique !