Dauphin

En résolvant $-3x^2+5x+2=0$ on trouve

$x = -\frac{1}{3}$ et 2

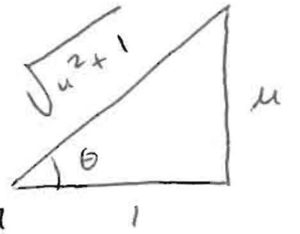
$$D = \int_{-\frac{1}{3}}^{2} \sqrt{1+\left(\frac{dy}{dx}\right)^2}\,dx = \int_{-\frac{1}{3}}^{2} \sqrt{1+(-6x+5)^2}\,dx \quad *$$

posons $u = -6x+5 \Rightarrow du = -6\,dx \Rightarrow -\frac{1}{6}du = dx$

$u\left(-\frac{1}{3}\right) = 7$ et $u(2) = -7$ ainsi

$$* = \frac{1}{6}\int_{-7}^{7} \sqrt{1+u^2}\,du = \frac{1}{3}\int_{0}^{7} \sqrt{1+u^2}\,du \quad (\text{Pourquoi ?})$$

$$= \frac{1}{3}\int_{\text{"}0\text{"}}^{\text{"}7\text{"}} \sec^3\theta\,d\theta = \frac{1}{3}\cdot\frac{1}{2}\Big[\sec\theta\tan\theta + \ln|\sec\theta+\tan\theta|\Big]_{\text{"}0\text{"}}^{\text{"}7\text{"}}$$



$$= \frac{1}{6}\Big[\sqrt{u^2+1}\cdot u + \ln \sqrt{u^2+1}+u\Big]_0^7$$

$$= \frac{1}{6}\cdot\Big[7\sqrt{50} + \ln \sqrt{50}+7\Big]$$

$= 8{,}69\ u$ (probablement des mètres)