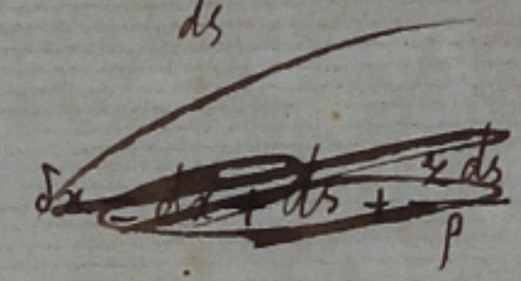
Monsieur Catalan,

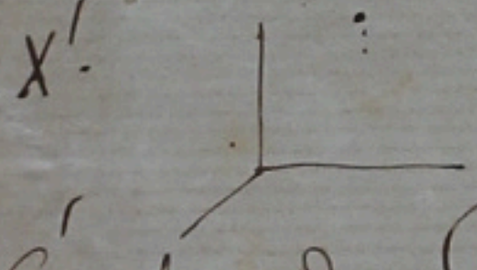
Nous venons bien en retard pour souhaiter, à vous et à Madame, toutes les prospérités désirables, à l'occasion de vos noces d'argent.

$$\left\{\begin{aligned}
\delta x &= dx + \left[\frac{df}{g\,dv}\,du - \frac{dg}{f\,du}\,dv\right] y - \left[\frac{f\,du}{\rho_1} + \frac{g\,dv}{\tau}\right] z + f\,du \\
\delta y &= dy - \left[\frac{df}{g\,dv}\,du - \frac{dg}{f\,du}\,dv\right] x - \left[\frac{f\,du}{\tau} + \frac{g\,dv}{\rho_2}\right] z + g\,dv \\
\delta z &= dz + \left[\frac{f\,du}{\rho_1} + \frac{g\,dv}{\tau}\right] x + \left[\frac{f\,du}{\tau} + \frac{g\,dv}{\rho_2}\right] y
\end{aligned}\right.$$

$f = 1$ $\quad du = ds$

$g = 0$ $\quad dv = 0$





Equations de Codazzi

$$\left|\begin{aligned}
&\frac{fg}{\rho_1\rho_2} - \frac{f\,g}{\tau^2} + \frac{d}{dv}\left(\frac{df}{g\,dv}\right) + \frac{d}{du}\left(\frac{dg}{f\,du}\right) = 0 \\
&\frac{d}{dv}\left(\frac{f}{\rho_1}\right) + g\,\frac{d}{du}\left(\frac{1}{\tau}\right) + \frac{2}{\tau}\,\frac{dg}{du} - \frac{df}{dv}\cdot\frac{1}{\rho_2} = 0 \\
&\frac{d}{du}\left(\frac{g}{\rho_2}\right) - f\,\frac{d}{dv}\left(\frac{1}{\tau}\right) - \frac{2}{\tau}\cdot\frac{df}{dv} - \frac{dg}{du}\cdot\frac{1}{\rho_1} = 0
\end{aligned}\right.$$

$$\left\{\begin{aligned}
\frac{d}{dv}\left(\frac{f}{\rho_1}\right) - g\,\frac{d}{du}\left(\frac{1}{\tau}\right) &= \frac{2}{\tau}\cdot\frac{dg}{du} + \frac{1}{\rho_2}\cdot\frac{df}{dv} \\
\frac{d}{du}\left(\frac{g}{\rho_2}\right) - f\,\frac{d}{dv}\left(\frac{1}{\tau}\right) &= \frac{2}{\tau}\cdot\frac{df}{dv} + \frac{1}{\rho_1}\cdot\frac{dg}{du}
\end{aligned}\right.$$

$$M = \frac{\dfrac{du}{g\rho_1} + \dfrac{2\,dv}{f\tau}}{\Delta}$$

$$N = -\frac{\dfrac{2\,du}{g\tau} + \dfrac{dv}{f\rho_2}}{\Delta}$$

$$\left(\frac{df}{g\,dv}\,du - \frac{dg}{f\,du}\,dv\right)\Delta = P\,du + Q\,dv$$

$$\left\{\begin{aligned}
\frac{M}{\rho_2} + \frac{2N}{\tau} &= \frac{du}{g} \\
\frac{2M}{\tau} + \frac{N}{\rho_1} &= -\frac{dv}{f}
\end{aligned}\right.$$

$$\Delta = \frac{1}{\rho_1\rho_2} - \frac{4}{\tau^2}$$

$$M\left(\frac{1}{\rho_1\rho_2} - \frac{4}{\tau^2}\right) = \frac{du}{g\rho_1} + \frac{2\,dv}{f\tau}$$

$$N\left(\frac{1}{\rho_1\rho_2} - \frac{4}{\tau^2}\right) = -\frac{2\,du}{g\tau} - \frac{dv}{f\rho_2}$$