How to solve this integral?

r, s, o, p, θ are known constants.

The original formulas are found on Page 3 and Page 7 in Cornelissen et al. (2023).

$$g_x = \frac{x-x^{'}}{(x-x^{'})^2+(y-y^{'})^2} \tag{10a}$$

$$\begin{aligned} G_x = \int_r^s \int_{y'\cot\theta}^{p} g_x\, dx' dy' = \frac{y-s}{2}\ln\left((x-p)^2+(y-s)^2\right) - \frac{y-r}{2}\ln\left((x-p)^2+(y-r)^2\right) \\ + (x-p)\left(\operatorname{atan}\left(\frac{y-s}{x-p}\right) - \operatorname{atan}\left(\frac{y-r}{x-p}\right)\right) \\ + \sin^2\theta\left(\frac{(x-o)\cot\theta+(y-r)}{2}\ln\left((x-o^2+(y-r)^2\right)\right. \\ - \frac{(x-p)\cot\theta+(y-s)}{2}\ln\left((x-p)^2+(y-s)^2\right) \\ \left. + (x-y\cot\theta)\left(\operatorname{atan}\left(\frac{(x-o)\cot\theta+(y-r)}{x-y\cot\theta}\right) - \operatorname{atan}\left(\frac{(x-p)\cot\theta+(y-s)}{x-y\cot\theta}\right)\right)\right) \end{aligned} \tag{27}$$

Taking derivative of G_x with respect to x yields G_{xx}

$$\begin{aligned} G_{xx} = \operatorname{atan}\left(\frac{y-s}{x-p}\right) - \operatorname{atan}\left(\frac{y-r}{x-p}\right) + \frac{\sin\theta\cos\theta}{2}\ln\left(\frac{(x-o)^2+(y-r)^2}{(x-p)^2+(y-s)^2}\right) \\ - \sin^2\theta\left(\operatorname{atan}\left(\frac{(x-p)\cot\theta+y-s}{x-y\cot\theta}\right) - \operatorname{atan}\left(\frac{(x-o)\cot\theta+y-r}{x-y\cot\theta}\right)\right) \end{aligned} \tag{29}$$

I don't know how $\int_r^s \int_{y^{'}\cot\theta}^{p} \frac{x-x^{'}}{(x-x^{'})^2+(y-y^{'})^2} dx^{'} y^{'}$ equals Eq. (27) and how $\frac{\partial G_x}{\partial x}$ equals Eq. (29).