

[178] [in pencil down left-hand side] 25<sup>th</sup> Aug<sup>st</sup>  
1843

$$\begin{aligned}u &= R + X \\P &= \frac{dR}{dx} + \frac{dX}{dx} \\ \frac{dX}{dx} &= P - \frac{dR}{dx} \\ X &= \int \left( P - \frac{dR}{dx} \right) dx \\ P &= -\frac{y^2}{x^2 \sqrt{x^2 + y^2}} \\ R &= \frac{\sqrt{x^2 + y^2}}{x}\end{aligned}$$

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$$\begin{aligned}& \frac{1}{\varepsilon^x + 1} \\& \frac{-\varepsilon^x}{(\varepsilon^x + 1)^2} \\& \frac{-(\varepsilon^x + 1)^{\cancel{x}} \cdot \varepsilon^x + \varepsilon^{2x} \cancel{2(\varepsilon^x + 1)}}{(\varepsilon^x + 1)^3} \\& \frac{\varepsilon^{2x} - \varepsilon^x}{(\varepsilon^x + 1)^3}\end{aligned}$$