

$$\text{Arc Length} = \int_a^b \underbrace{\sqrt{1 + \left(\frac{dy}{dx}\right)^2}}_{\text{cartesian}} dx$$

Definition of Arc Length

If the function given by $y = f(x)$ represents a smooth curve on the interval $[a, b]$, then the arc

length of f between a and b is given by $s = \int_a^b \sqrt{1 + [f'(x)]^2} dx$.