$$\left.\begin{aligned} \text{perimeter} &= 4\int_0^1 \sqrt{1 + x^{-2/3} - 1}\, dx = 4\int_0^1 x^{-1/3}\, dx \\ &= 4\left[\tfrac{3}{2} x^{2/3}\right]_0^1 = 4\cdot\tfrac{3}{2} = \underline{\underline{6}} \end{aligned}\right\} \quad (*)$$

<u>Note:</u> The Riemann integral $\int_0^1 x^{-1/3}\, dx$ does not exist since $x^{-1/3}$ is unbounded as $x \to 0+$. However, if we take <u>only</u> the length between $x = \varepsilon$ and $x = 1$ and then take $\lim\limits_{\varepsilon \to 0}$, we get basically the same result in a cleaner way:

$$\left.\begin{aligned} \text{perimeter} &= 4\lim_{\varepsilon\to 0}\int_\varepsilon^1 \sqrt{1 - x^{-2/3} - 1} = 4\lim_{\varepsilon\to 0}\int_\varepsilon^1 x^{-1/3}\, dx = \\ &= 4\lim_{\varepsilon\to 0}\left[\tfrac{3}{2} x^{2/3}\right]_\varepsilon^1 = 6 - \lim_{\varepsilon\to 0} 6\,\varepsilon^{2/3} = \underline{\underline{6.}} \end{aligned}\right\} \quad (**)$$

The above calculation $(*)$ should be read as a shorthand for the precise calculation $(**)$.