

Section 8.1: Arc Length

Suppose f is a continuous function over an interval $[a, b]$, and suppose we want to calculate the **length of the curve** $y = f(x)$ over the interval $[a, b]$. We have seen that we can use a definite integral to find the arc length L of f over $[a, b]$:

$$L = \int_a^b \sqrt{1 + [f'(x)]^2} dx.$$

Use this formula to find the arc length of the following curves over the indicated interval.

1. $f(x) = 3x^{2/3} - 10$ from point $P(8, 2)$ to $Q(27, 17)$.

2. $y = x^3 - x$ from $P(-1, 0)$ to $Q(2, 6)$.