The arc length formula Examples

§8.1–Arc Length

Tom Lewis

Spring Semester 2015

The arc length formula Examples

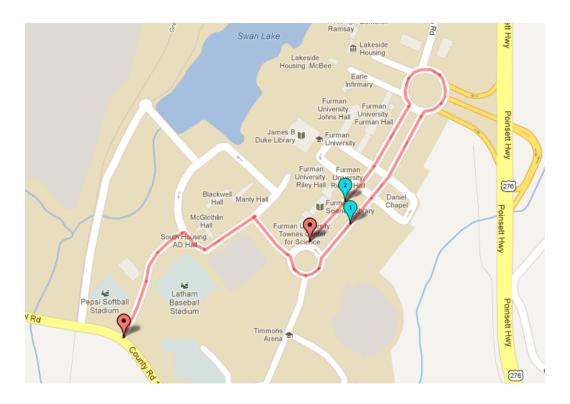
Outline

The arc length formula

Examples

The arc length formula Examples

How to estimate the length of a route



The arc length formula Examples

Theorem (Arc length formula)

If f' is continuous on [a, b], then the length of the curve y = f(x), $a \leqslant x \leqslant b$, is

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

The arc length formula Examples

Problem

Find the length of the curve $y = x^{3/2}$, $0 \le x \le 44$.

The arc length formula Examples

Problem

Find the length of the curve $y = \frac{1}{10}x^5 + \frac{1}{6}x^{-3}$, $1 \leqslant x \leqslant 2$.