

1 Calc 2 Basics

5.3 Average Value

5.5 U-Substitution

5.6

6.1

6.2

2 Integral Applications and Sections

8.2

8.3

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8.5

3 Sequences, Series, and Tests

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10.1

10.2

10.3

10.4

4 Sequences, Series, and Tests cont.

10.5

10.6

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10.9

5 Parametric Curves

10.10

6.3 Arc Length

Pythagorean's Theorem can be applied to find the length of a segment $f(x)$. If ds is equal to a single straight segment in $f(x)$, then dx is equal to the horizontal length and dy is equal to its vertical length.

$$\begin{aligned}(ds)^2 &= (dx)^2 + (dy)^2 \\ \sqrt{(ds)^2} &= \sqrt{(dx)^2 + (dy)^2} \\ ds &= dx \sqrt{(dx)^2 / (dx)^2 + (dy)^2 / (dx)^2} \\ ds &= \sqrt{1 + (dy/dx)^2} dx\end{aligned}\tag{1}$$

By taking the integral of this, you can get the total length of the segment.

$$s = \int_a^b \sqrt{1 + (f'(x))^2} dx,\tag{2}$$

6.4

11.1

11.2

6 Polar Coordinates

11.3

11.4

11.5