

7.4 Length of a Curve

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Definition of Arc Length

$$L = \int_a^b \sqrt{1 + \left(\frac{dy}{dx}\right)^2} dx$$

$$L = \int_c^d \sqrt{1 + \left(\frac{dx}{dy}\right)^2} dy$$

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Find the exact length of the curve $y = x^2$ $0 \leq x \leq 4$

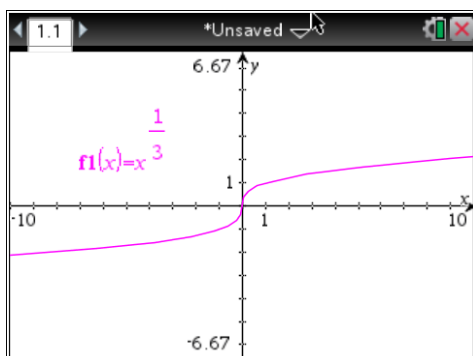
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Find the exact length of the curve $y = \frac{4\sqrt{2}}{3}x^{\frac{3}{2}} - 1$ $0 \leq x \leq 1$

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A vertical tangent

Find the length of the curve $y = \sqrt[3]{x}$ between $(-8, -2)$ and $(8, 2)$

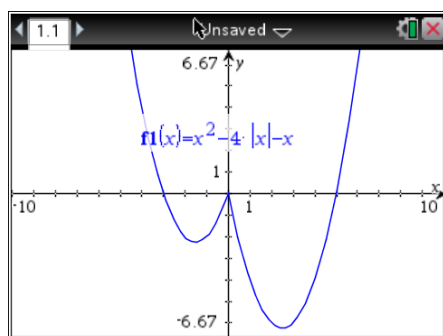


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A cusp

Find the length of the curve $y = x^2 - 4|x| - x$

from $x = -4$ to $x = 4$



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$$y^2 + 2y = 2x + 1$$

(-1, -1) to (7, 3)

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