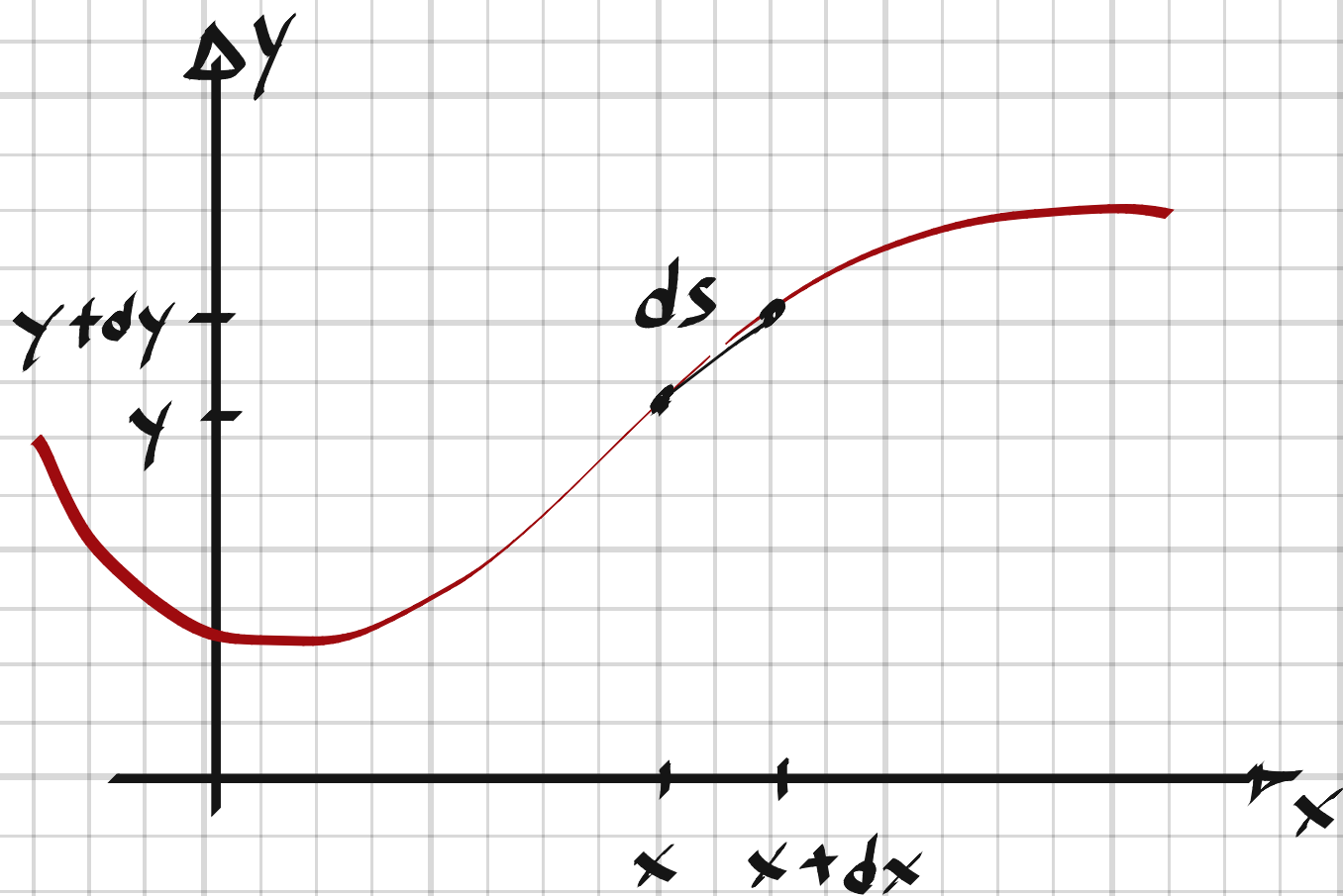


# Kurvenslänge



$$ds = \sqrt{(dx)^2 + (dy)^2} = \sqrt{1 + \left(\frac{dy}{dx}\right)^2} \cdot dx$$

$$s = \int ds = \int \sqrt{1 + (y')^2} \cdot dx$$

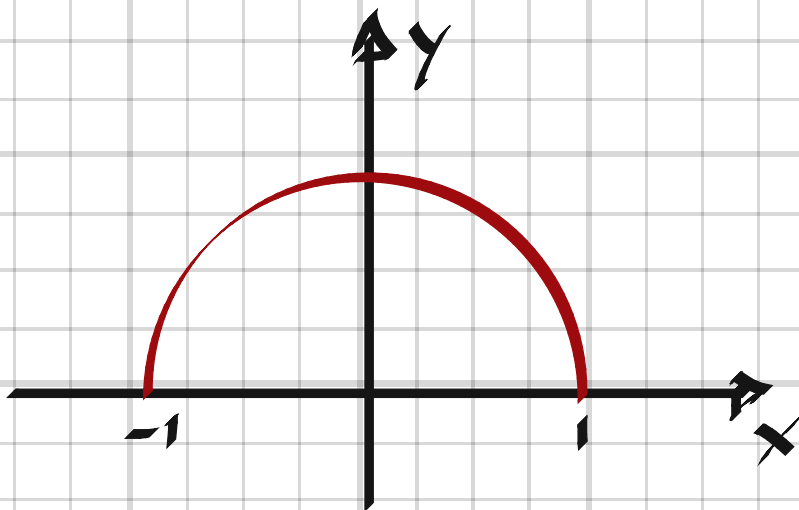
ex. Bestäm talet  $\pi$  m h a  
formeln för kurvans längd.

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

$$y = \pm \sqrt{1 - x^2}$$

$$y' = \mp \frac{x}{\sqrt{1 - x^2}}$$

$$(y')^2 = \frac{x^2}{1 - x^2}$$



$$s = \int_{-1}^1 \sqrt{1 + (y')^2} \cdot dx = \int_{-1}^1 \frac{dx}{\sqrt{1 - x^2}} =$$

$$= [\arcsin(x)]_{-1}^1 = \frac{\pi}{2} - (-\frac{\pi}{2}) = \pi$$

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