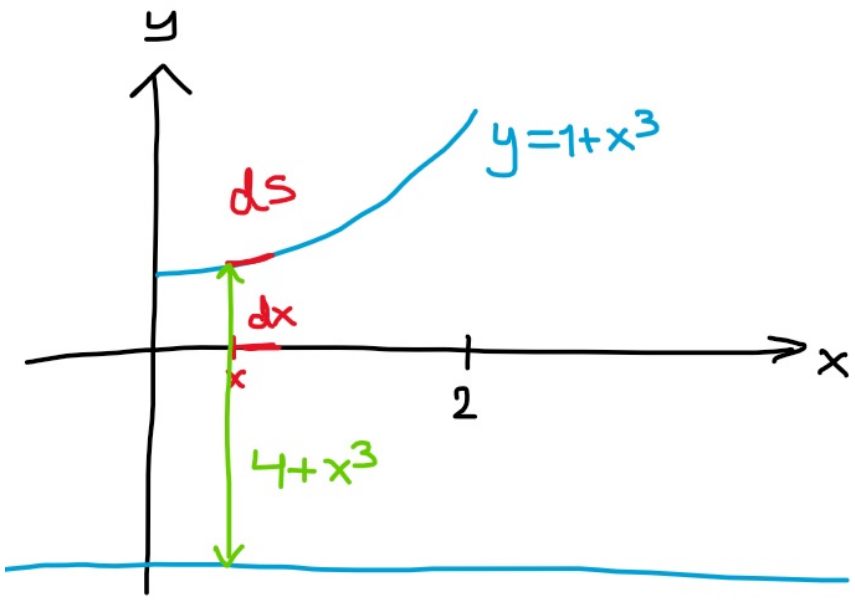
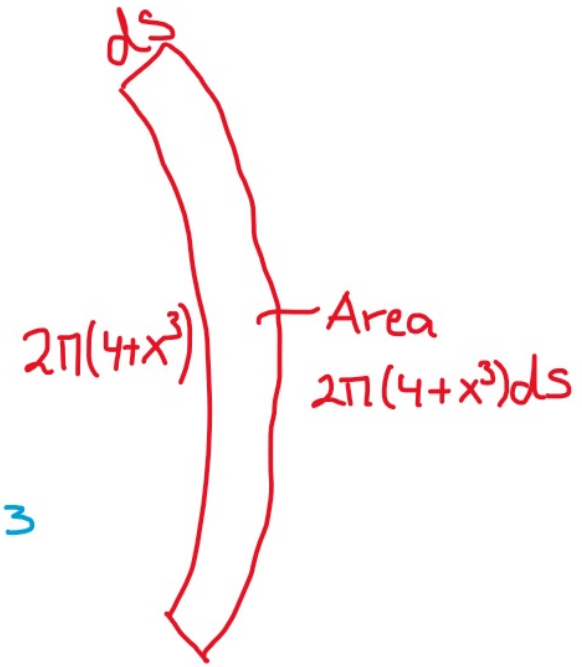
Exempel

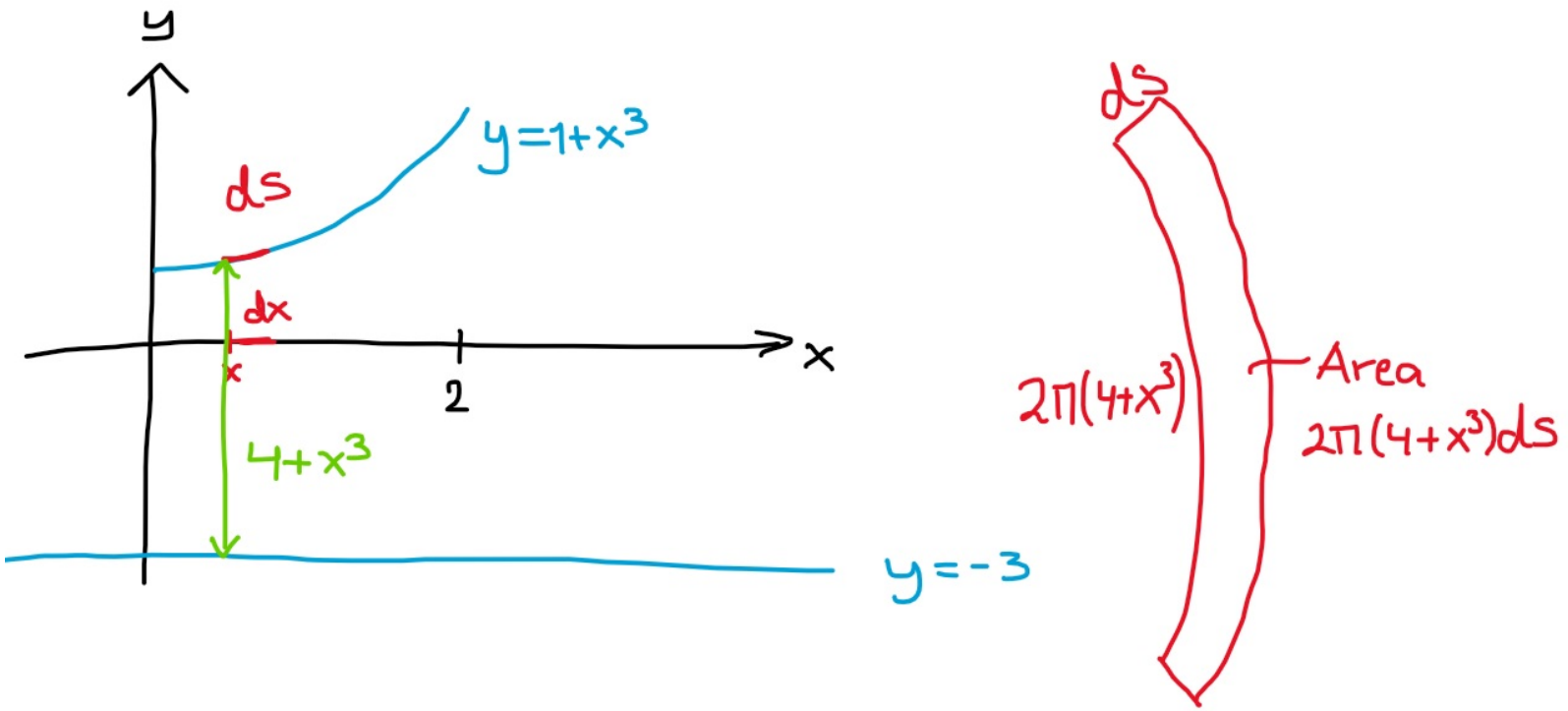
Ange en integralformel för arean av den yta som uppstår då kurvan $y = 1 + x^3$, $0 \leq x \leq 2$ roteras ett varv runt $y = -3$.

Lösning



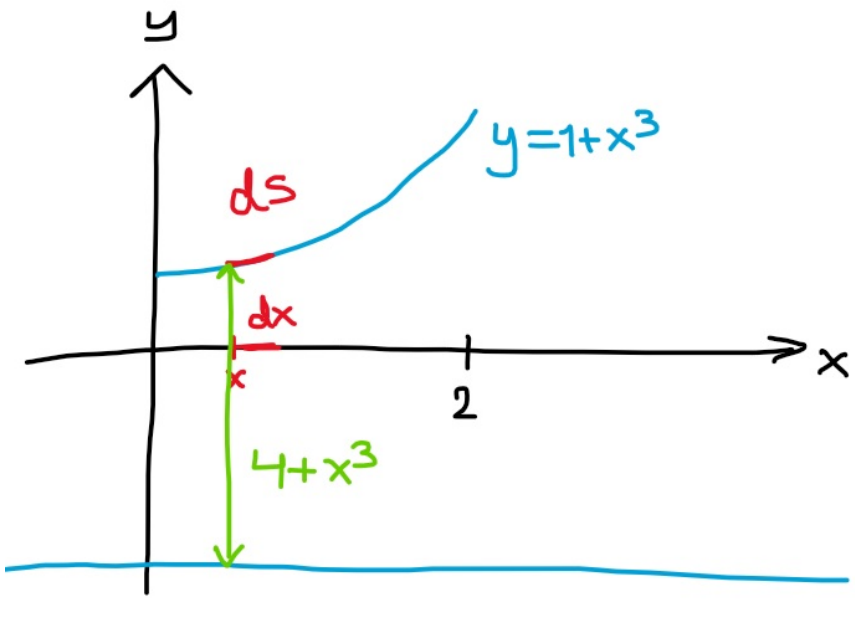


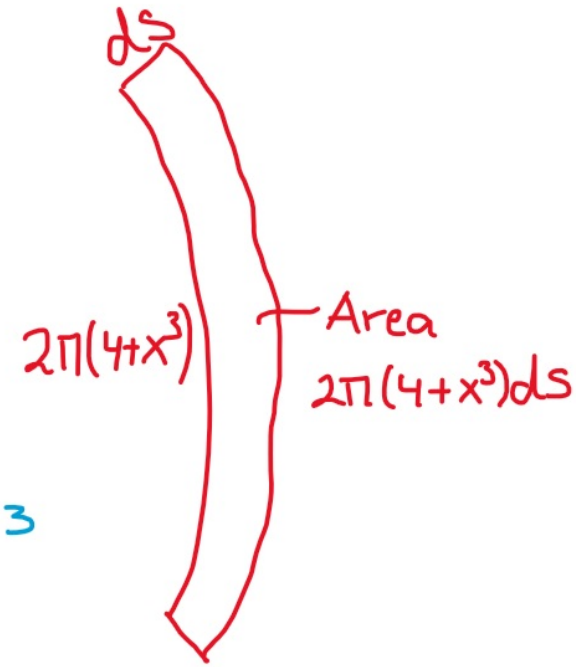
Lösning



$$ds = \sqrt{1 + y'(x)^2}dx = \sqrt{1 + 9x^4}dx.$$

Lösning





$$ds = \sqrt{1 + y'(x)^2}dx = \sqrt{1 + 9x^4}dx.$$

$$\text{Area:} \quad \int_0^2 2\pi(4 + x^3)\sqrt{1 + 9x^4}dx.$$