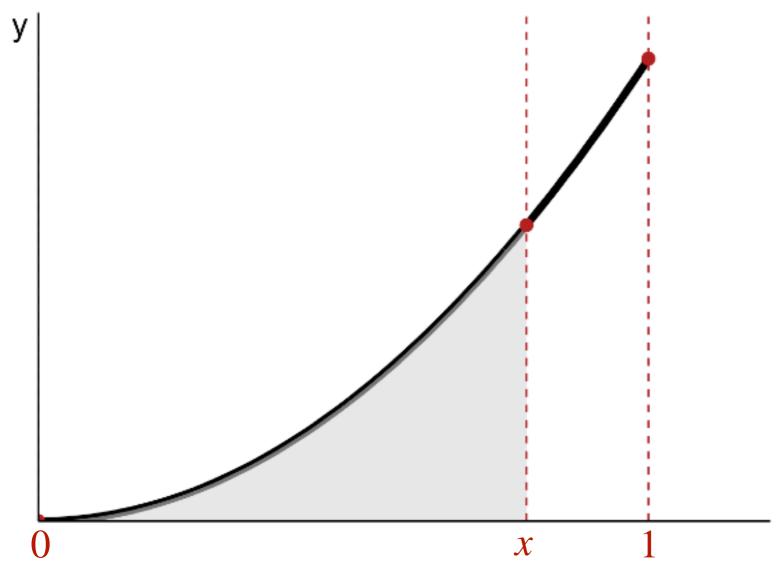


## definite and indefinite integral





## indefinite integral



## definite and indefinite integral

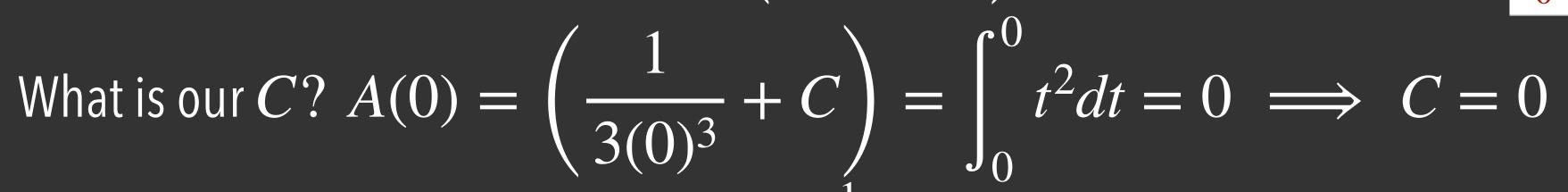
example

Consider  $f(t) = t^2$  and let's calculate the area under  $y = t^2$  between 0 and 1.

The area up to 
$$x$$
 is represented by  $A(x) = \int_0^x t^2 dt$  integral integral

We know 
$$A'(x) = x^2 \implies A(x) = \frac{1}{3}x^3$$

This holds for any constant 
$$C$$
:  $\frac{d}{dx} \left( \frac{1}{3x^3} + C \right) = x^2$ 



Further we have 
$$A(1) = \frac{1}{3}x^3 \Longrightarrow \int_0^1 t^2 dt = A(1) - A(0)$$
 where  $A'(x) = x^2$ 

= 0  $e A'(x) = x^2$ 

definite integral

## the fundamental theorem of calculus, part 1