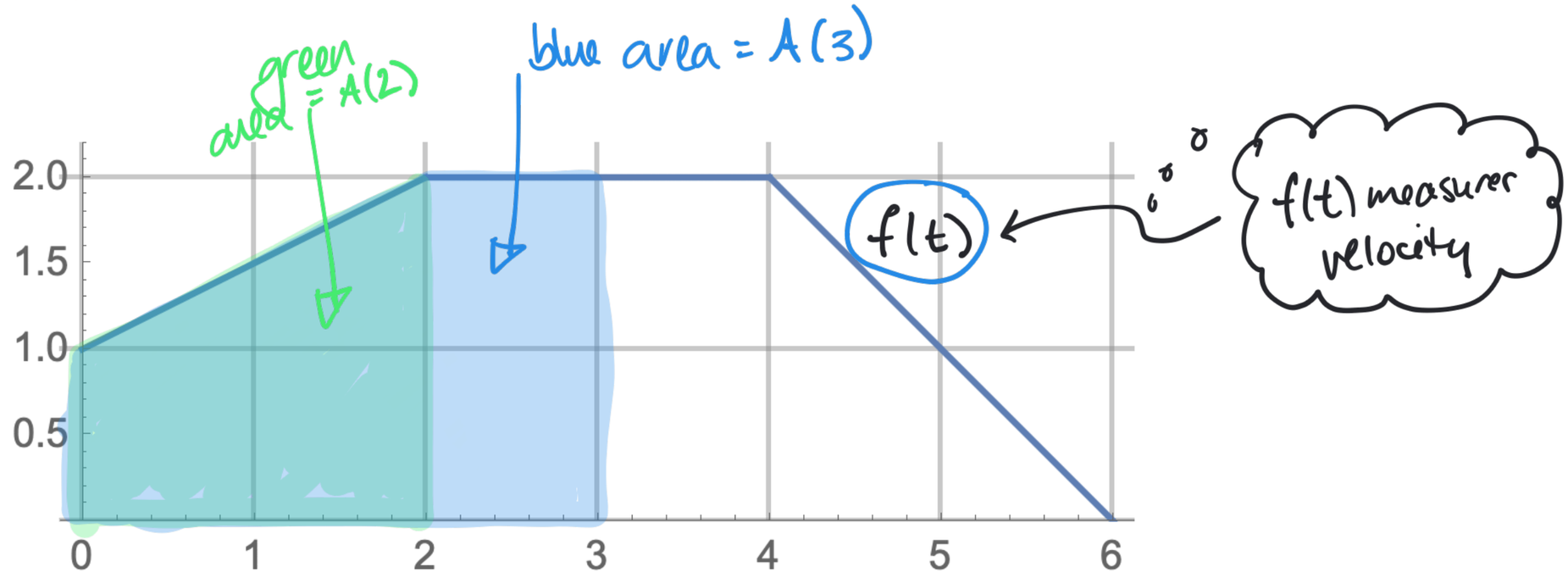
Intro Video: Section 5.2 part 2
“area so far” functions

Math F251X: Calculus I

We would like a function that measures, at any time t, how much area we have accumulated!



Define $A(t) = \int_0^t f(x)\,dx$

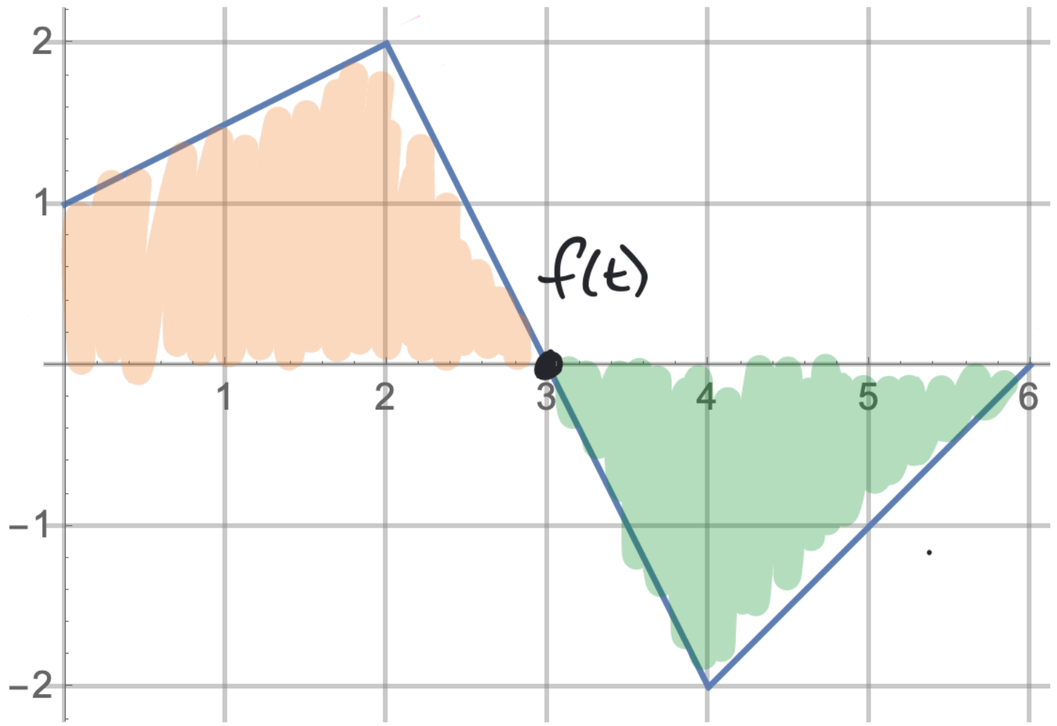
this x is called the "dummy variable" of integration. It can't be t, because t already has a use.

$A(2) = 3$

$A(3) = \int_0^3 f(x)\,dx = 5.$

$\rightarrow$ A(t) is increasing on $[0, 6]$

$$A(t) = \int_0^t f(x)\,dx$$



$A(1) = \int_0^1 f(x)\,dx = 1.5$

$A(2) = \int_0^2 f(x)\,dx = 3$

$A(3) = \int_0^3 f(x)\,dx = 4$

$A(4) = \int_0^4 f(x)\,dx = 3$

$A(5) = \int_0^5 f(x)\,dx = 1.5$

$A(6) = \int_0^6 f(x)\,dx = 1$

$A(t)$ has a local maximum at $t = 3$

→ $A(t)$ is increasing from $t=0$ to $t=3$

→ $A(t)$ is decreasing from $t=3$ to $t=6$.