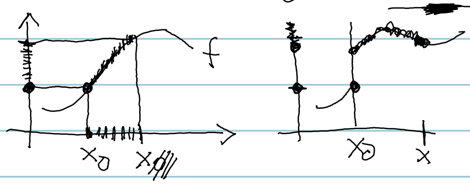
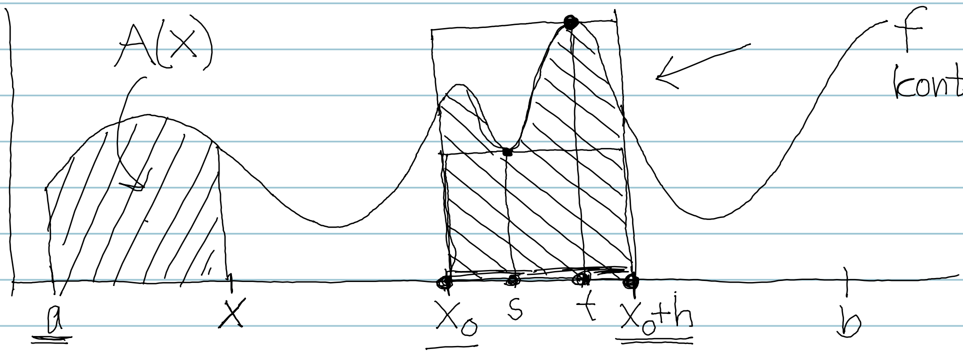
f er kont i x_0 $\overset{\text{DEF}}{\Leftrightarrow}$ $f(x) \to f(x_0)$ for $x \to x_0$



Når $h \to 0$ så vil

$s \to x_0$

$t \to x_0$



Arealfunktionen $A(x)$ PST: $A'(x_0) = f(x_0)$

(1) $\Delta A = A(x_0+h) - A(x_0)$

(2) $\dfrac{\Delta A}{h} = \ldots\ldots$

(3) $\dfrac{\Delta A}{h} \to A'(x_0)$ for $h \to 0$

$$\frac{f(s)\cdot \cancel{h}}{\cancel{h}} \le \frac{\Delta A}{h} \le \frac{f(t)\cdot \cancel{h}}{\cancel{h}}$$

$$f(s) \le \frac{\Delta A}{h} \le f(t)$$

$$\downarrow \qquad \downarrow \qquad \downarrow$$

$$f(x_0) \le f(x_0) \le f(x_0)$$

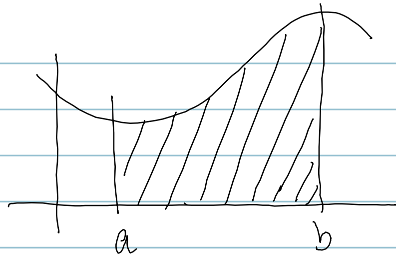
dvs. $A'(x_0) = f(x_0)$

SÆTN: HVIS

f er kont på $[a,b]$

SÅ

har f et max og min



f kont, ≥ 0

PST: Arealet $= F(b) - F(a)$

hvor F er vilk. stamfkt. til f

Bevis:

$$F(x) = A(x) + k$$

$$F(b) = A(b) + k$$

$$F(a) = A(a) + k$$

$$F(b) - F(a) = A(b) + k - (A(a) + k)$$

$$= A(b) + k - A(a) + k$$

$$= A(b) - A(a)$$

$$\boxed{F(b) - F(a) = \text{Arealet}} - 0$$

$$\int_a^b f(x)\,dx = \Big[F(x)\Big]_a^b = F(b) - F(a)$$