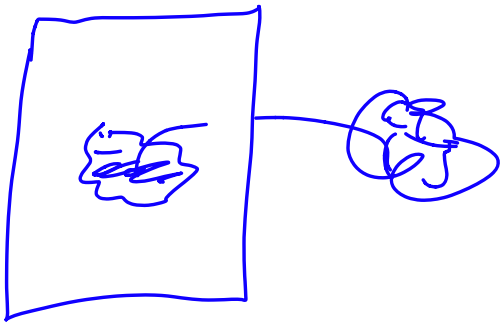
Questions:



$$f(x+h) - f(x) = g(h)$$

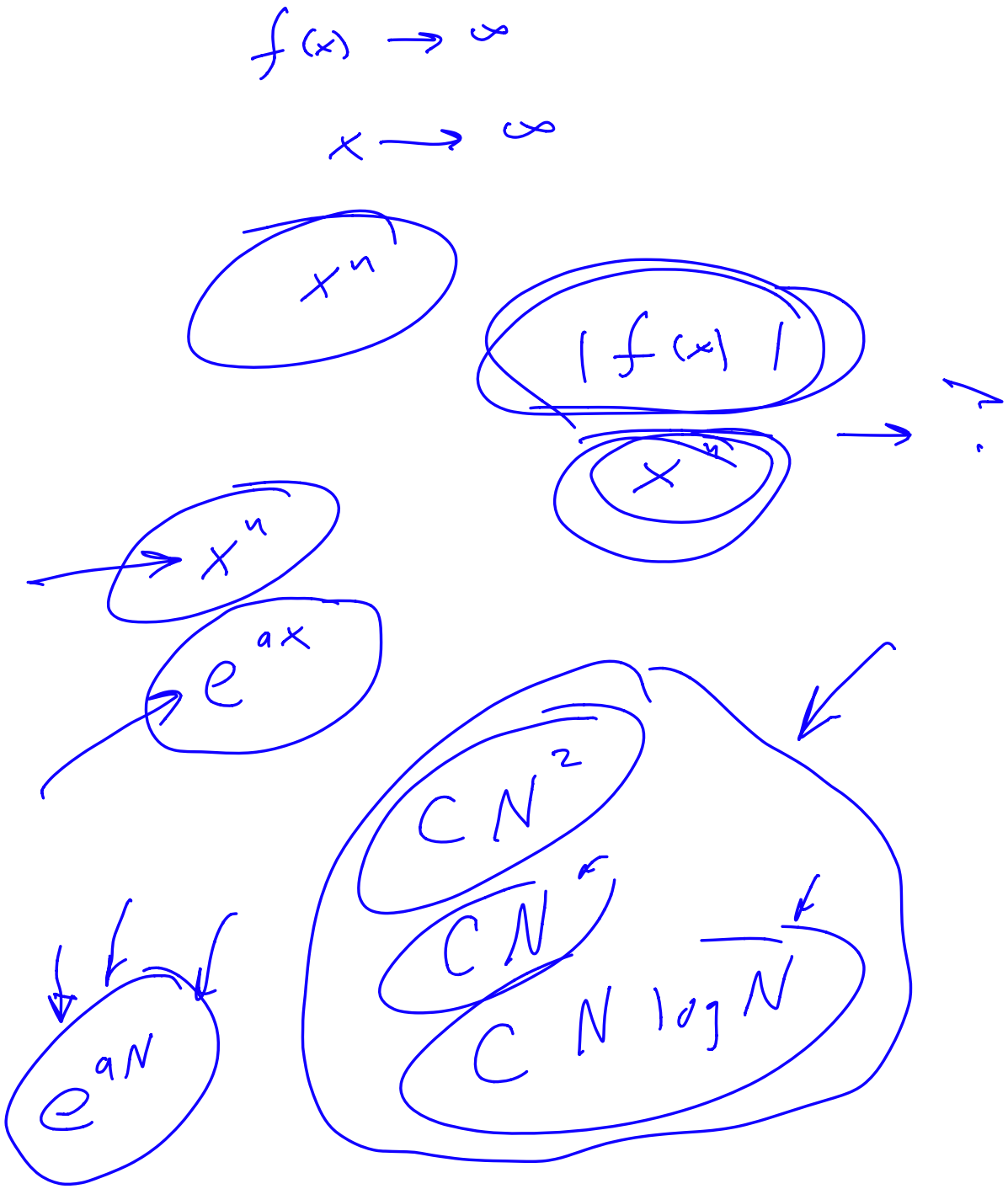
$$\frac{|g(h)|}{|h|} \to 0 \quad |h| \to 0$$

$$g \sim o(h)$$

$$\frac{|g(h)|}{|h|} < c < \infty \Rightarrow |g(h)| < c|h|$$

$h \in (-\varepsilon, \varepsilon)$

$g \sim O(h)$


$f(x) \to \infty$
$x \to \infty$
$x^n$
$|f(x)|$
$x^n$
$x^n$
$e^{ax}$
$e^{aN}$
$CN^2$
$CN$
$CN \log N$

$f$ smooth $\equiv$ $f$ has derivatives of all orders

$f, f', f'', f''' \quad C^\infty$

$e^x \qquad C^3$

$x^2$

$2x$

$2$

$0$

$0$

$0$

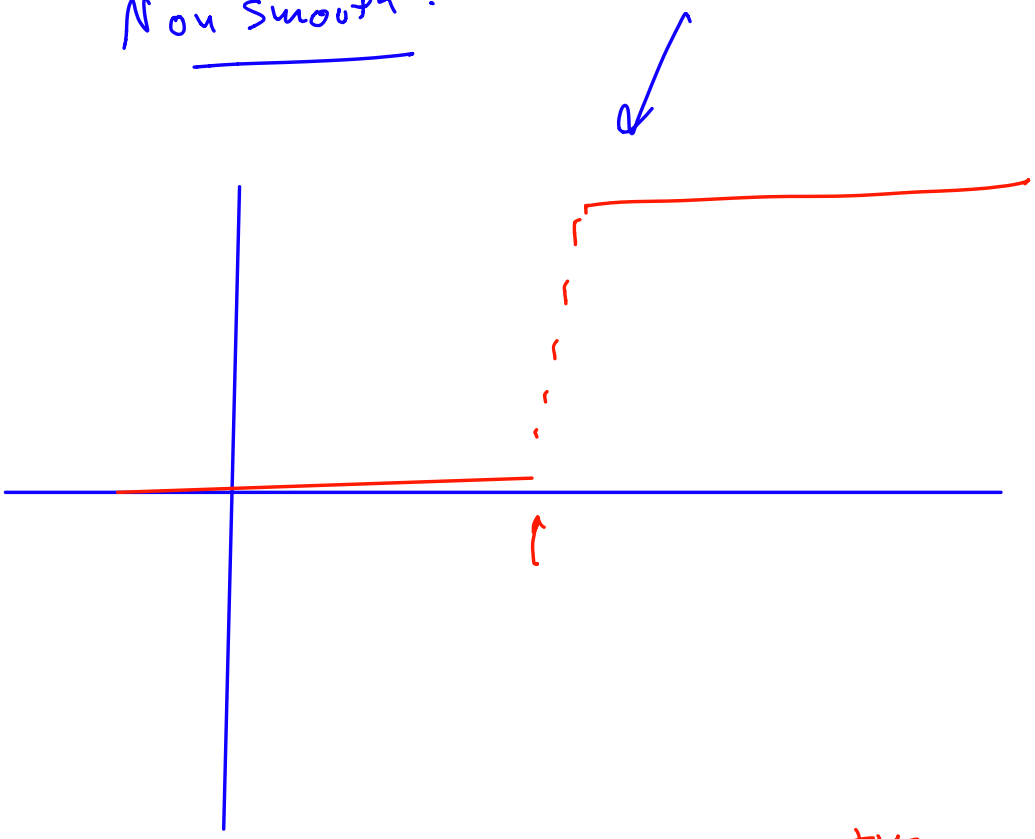
$0$

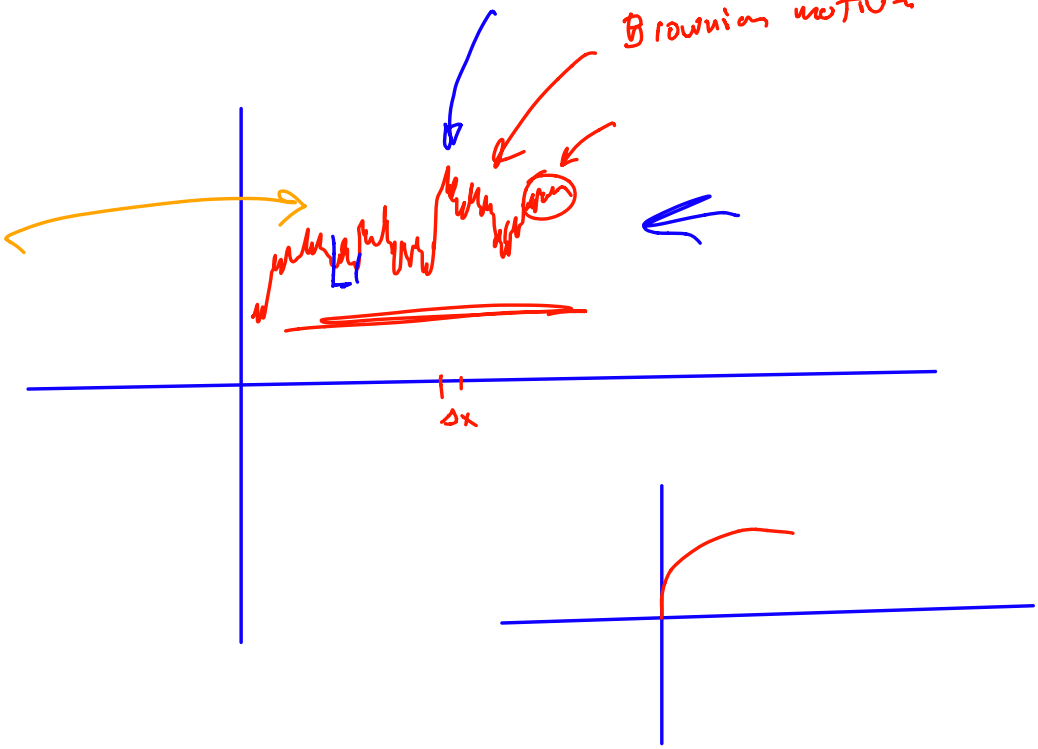
$0$

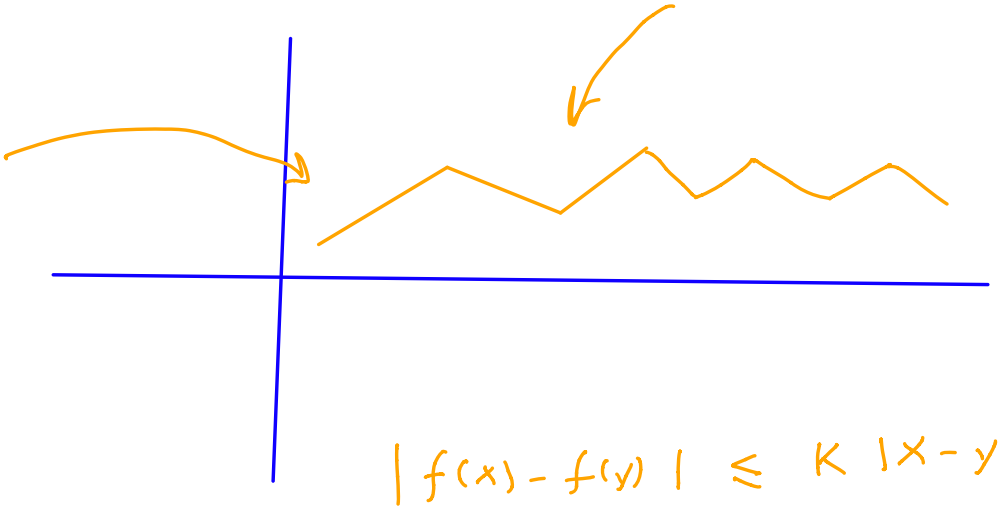
$0$

$0$

Non Smooth :

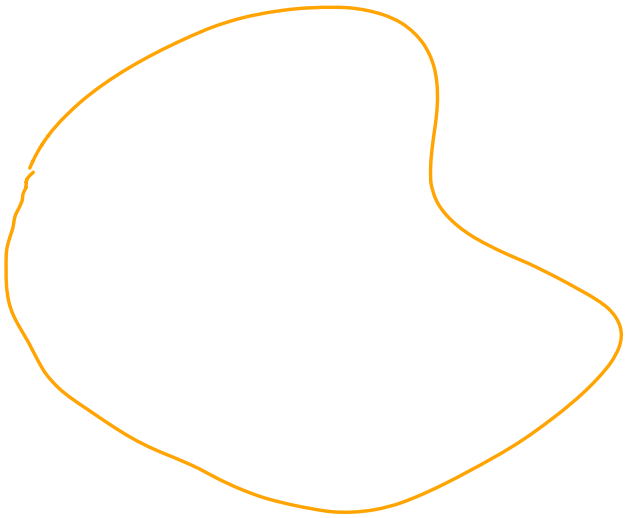


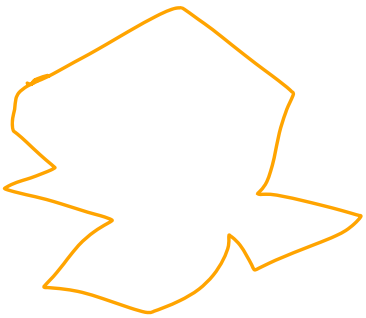


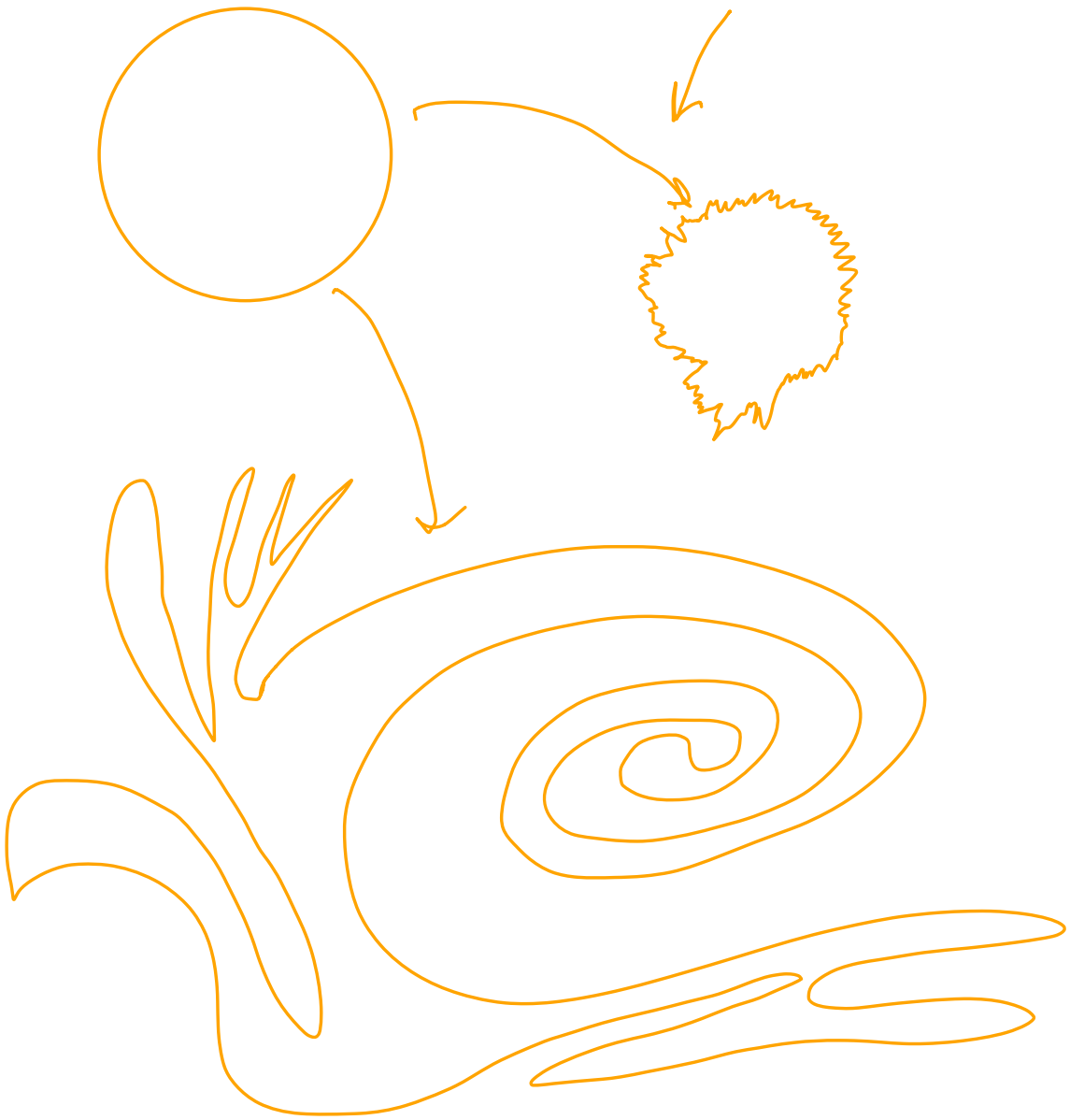


$$|f(x) - f(y)| \leq K|x - y|$$

$f$ Lipschitz $\Rightarrow$ $f$ diff a.e.







$$\dot{x}(t) \leq a\,x(t) \qquad \forall\, t \in [0, T]$$

$$x(t) \leq e^{at} x(0)$$

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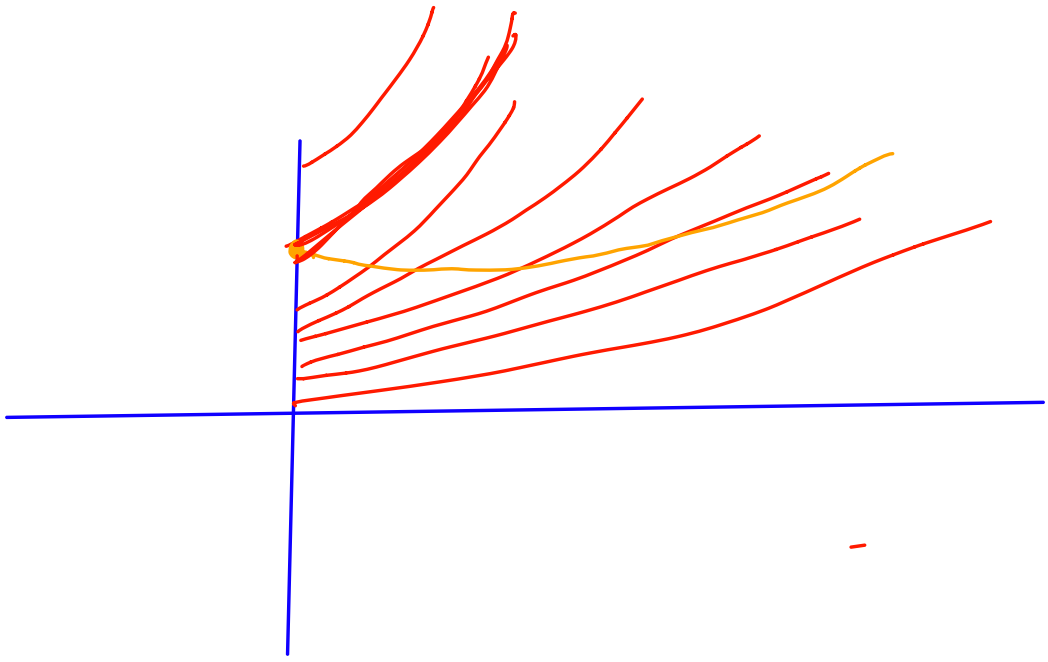
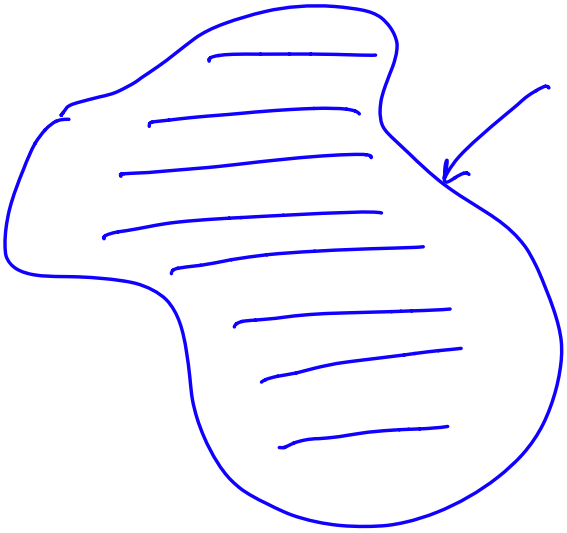
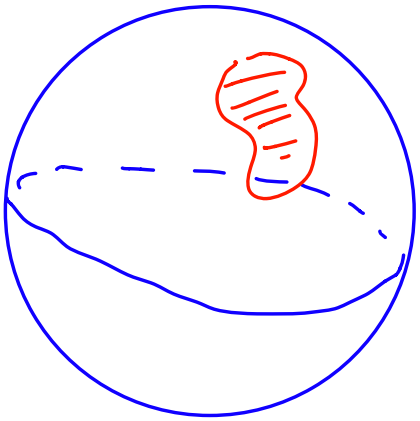
$$\dot{x}(t) = a\,x(t)$$

$$x(t) = x(0) e^{at}$$



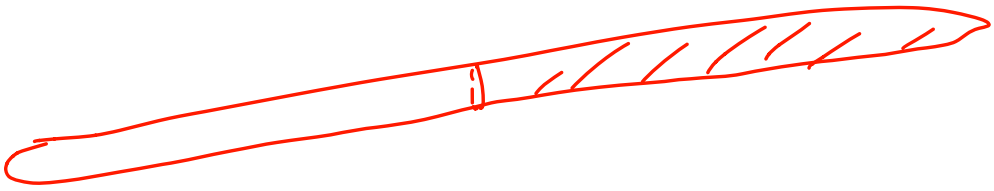


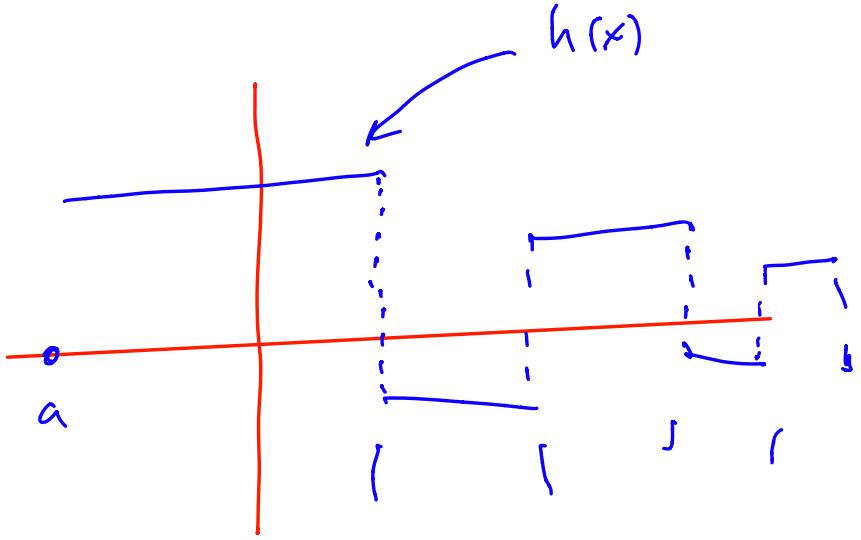


$$\frac{p^2}{A}$$

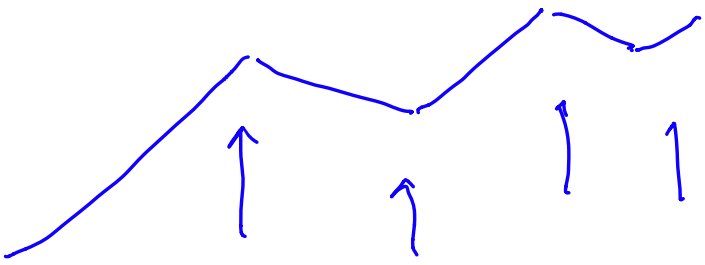
$$\frac{(2\pi r)^2}{\pi r^2}$$

$$4\pi$$






$$g(x) = \int_a^x h(y)\, dy$$



$$K(x) = \int_a^x g(x)\, dy$$