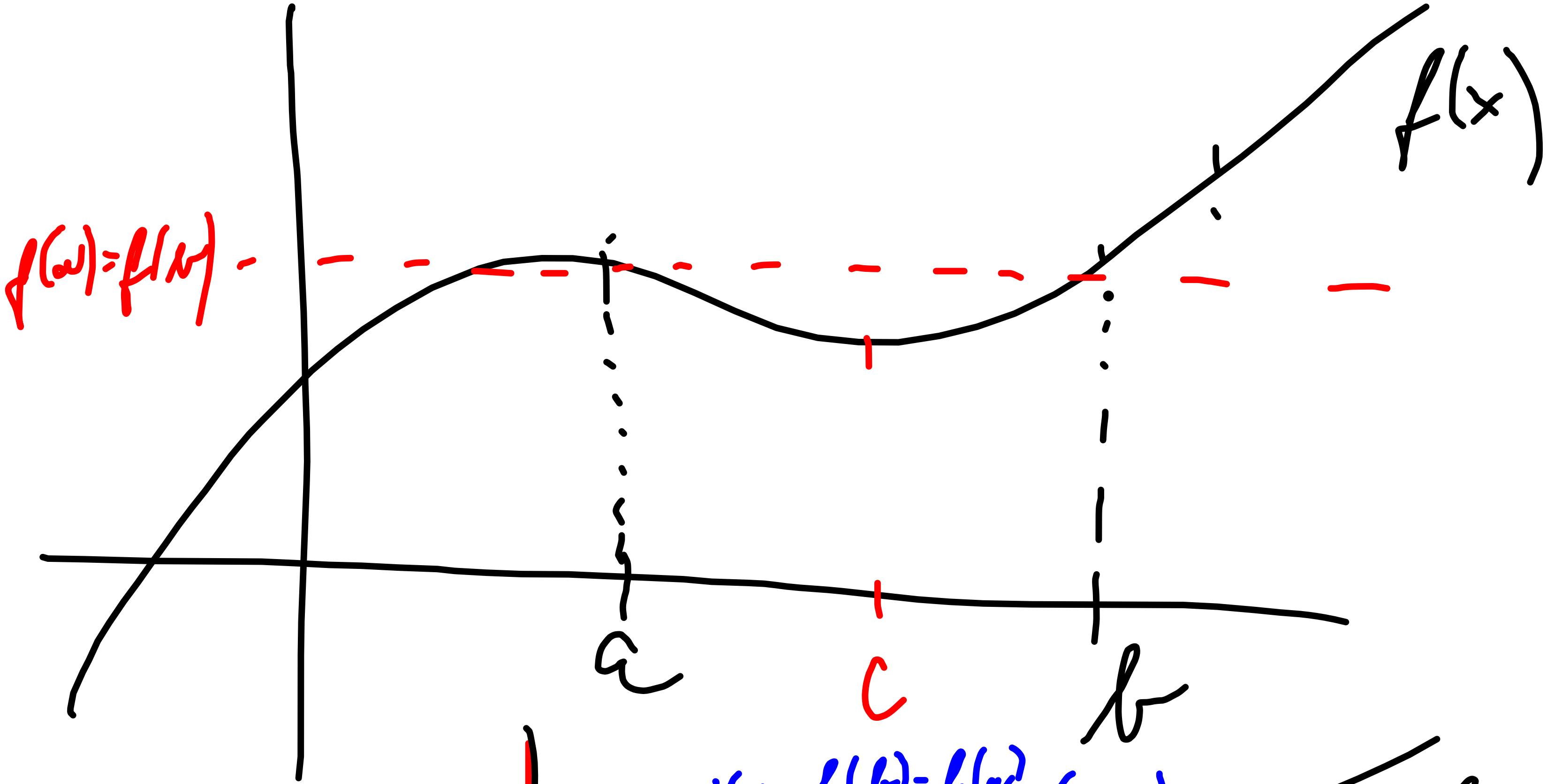
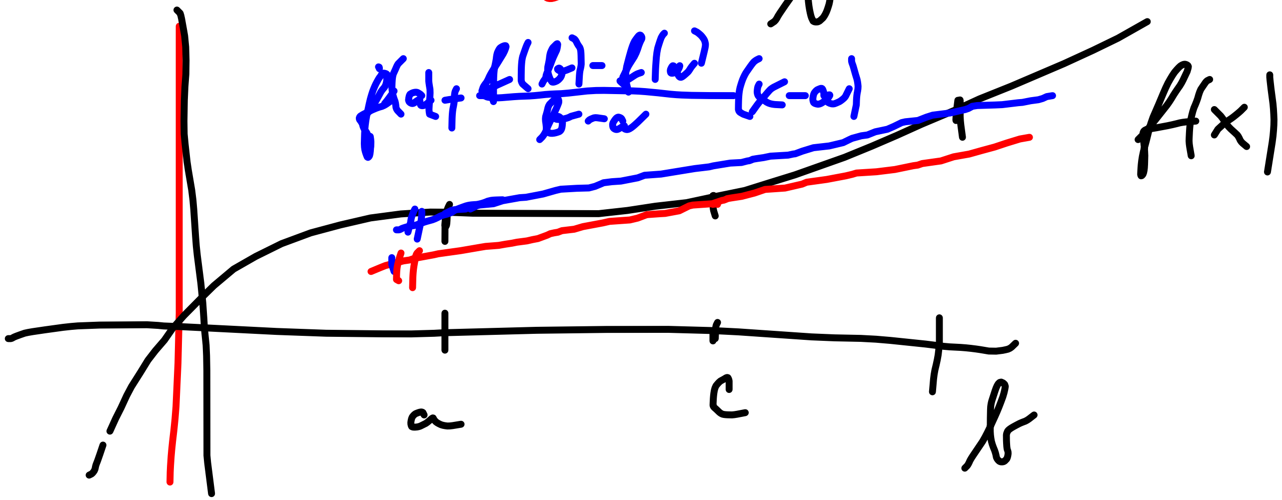


f(a)=f(b)
f(x)
a
c
b



f(a)+ (f(b)-f(a))/(b-a) (x-a)
f(x)
a
c
b

$h(x) = f(x) -$ přímka

$h(a) = h(b) = 0$, podle Rolleovy věty

$\exists c \in (a, b): \quad h'(c) = 0$

$$0 = h'(c) = f'(c) - \frac{f(b) - f(a)}{b - a} \Rightarrow$$

$$f'(c) = \frac{f(b) - f(a)}{b - a}$$

$$\lim_{x\to x_0}\frac{f(x)}{g(x)}=\lim_{x\to x_0}\frac{f(x)-f(x_0)}{g(x)-g(x_0)}=\lim_{x\to x_0}\frac{f'(c_x)}{g'(c_x)}$$

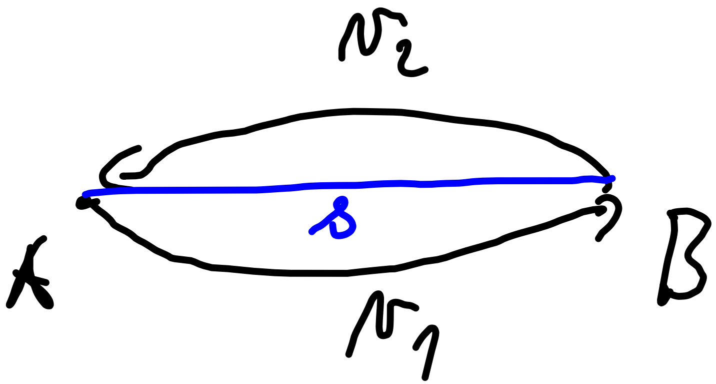
kde $c_x\in(x_0,x)$ $$=\lim_{c_x\to x_0}\frac{f'(c_x)}{g'(c_x)}$$

$$\lim_{x\to 0}\left(\frac{1}{\sin 2x}-\frac{1}{2x}\right)=\lim_{x\to 0}\frac{2x-\sin 2x}{2x\sin 2x}=$$

$$=\lim_{x\to 0}\frac{2-2\cos 2x}{2\sin 2x+4x\cos 2x}=$$

$$=\lim_{x\to 0}\frac{4\sin 2x}{4\cos 2x+4\cos 2x-8x\sin 2x}=$$

$$=0$$



$\frac{s}{v_1}$ … čas potřebný k cestě z A do B

$\frac{s}{v_2}$ … ———— " ———— B do A

$$\frac{2s}{v} = \frac{s}{v_1} + \frac{s}{v_2} \Rightarrow$$

$$\Rightarrow \frac{2}{v} = \frac{1}{v_1} + \frac{1}{v_2} \Rightarrow v = \frac{2}{\frac{1}{v_1} + \frac{1}{v_2}}$$

$$r_1 > r_2 \Rightarrow M^{r_1}(x_1, \dots, x_n) > M^{r_2}(x_1, \dots, x_n)$$

$r = -1$ Harmonický průměr:

$$H(x_1, \dots, x_n) = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n}}$$

$$\lim_{r \to 0} M^r(x_1, \dots, x_n) = G(x_1, \dots, x_n)$$

Spočítáme: $\lim_{r \to 0} \ln\left(M^r(x_1, \dots, x_n)\right) =$

$$= \lim_{r \to 0} \ln\left(\frac{x_1^r + x_2^r + \dots + x_n^r}{n}\right)^{\frac{1}{r}}$$

$$\lim_{r\to 0} \frac{1}{r} \ln\left(\frac{x_1^r + x_2^r + \dots + x_n^r}{n}\right) =$$

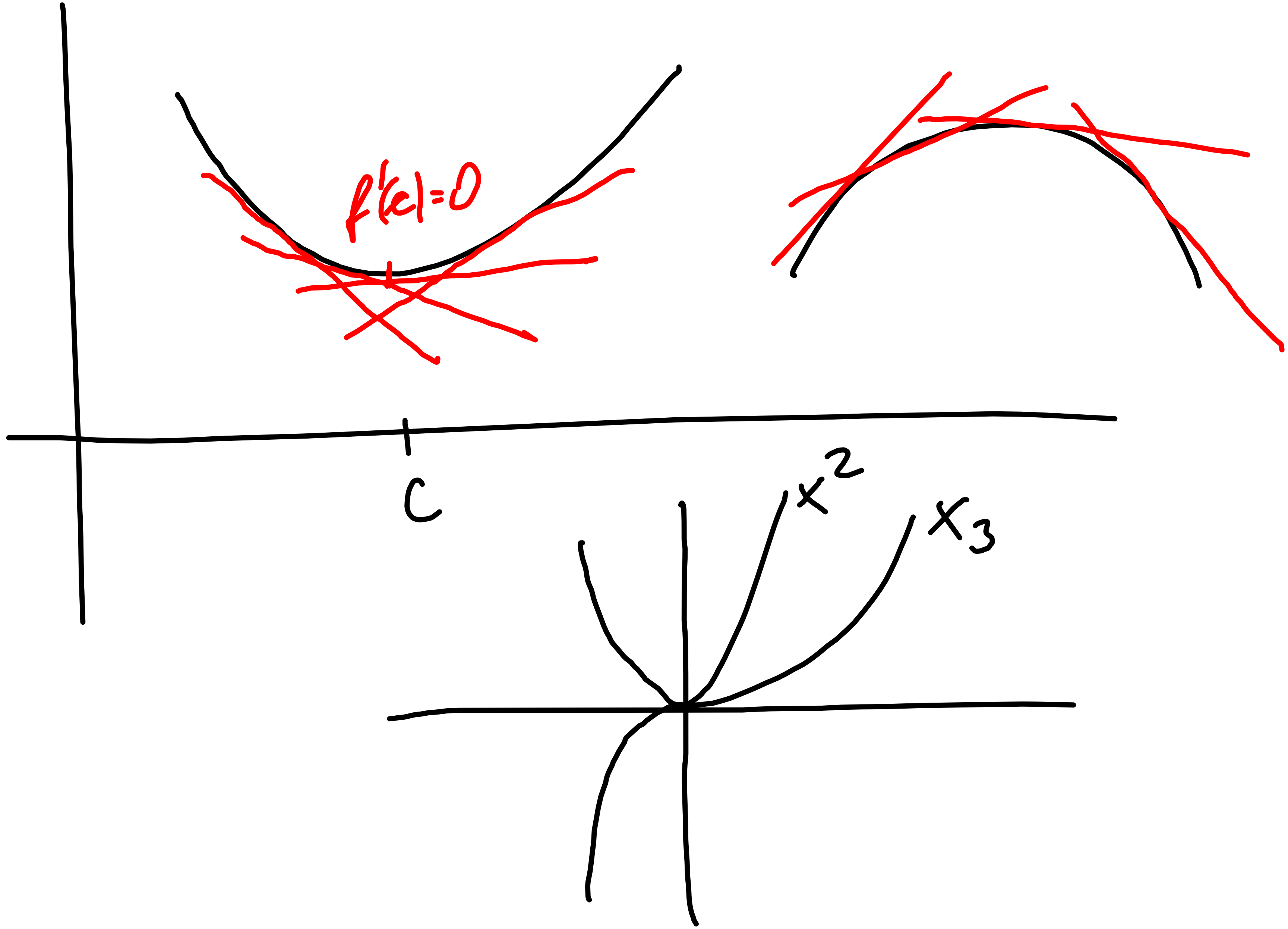
$$= \lim_{r\to 0} \frac{\frac{1}{n}\left[x_1^r \ln x_1 + x_2^r \ln x_2 + \dots + \ln x_n \, x_n^r\right]}{\left(\frac{x_1^r + x_2^r + \dots + x_n^r}{n}\right)} =$$

$$\left(a^r\right)' = \left(e^{r\ln(a)}\right)' = \ln a \left(a^r\right)$$

$$= \frac{\frac{1}{n}\left(\ln x_1 + \ln x_2 + \dots + \ln x_n\right)}{1} =$$

$$= \ln\left(\sqrt[n]{x_1 \cdot x_2 \cdot \dots \cdot x_n}\right) \Rightarrow$$

$$\Rightarrow \lim_{r\to 0} M^r(x_1, \dots, x_n) = \sqrt[n]{x_1 \cdots x_n} = G(x_1, \dots, x_n)$$



$f'(c)=0$
c
x^2
x_3

$$f(x) = \sum_{i=0}^{\infty} a_i x^i \overset{?}{=} \sum_{i=0}^{\infty} \frac{f^{(i)}(0)}{i!} x^i$$

$x = 0$ $\quad f(0) = a_0$

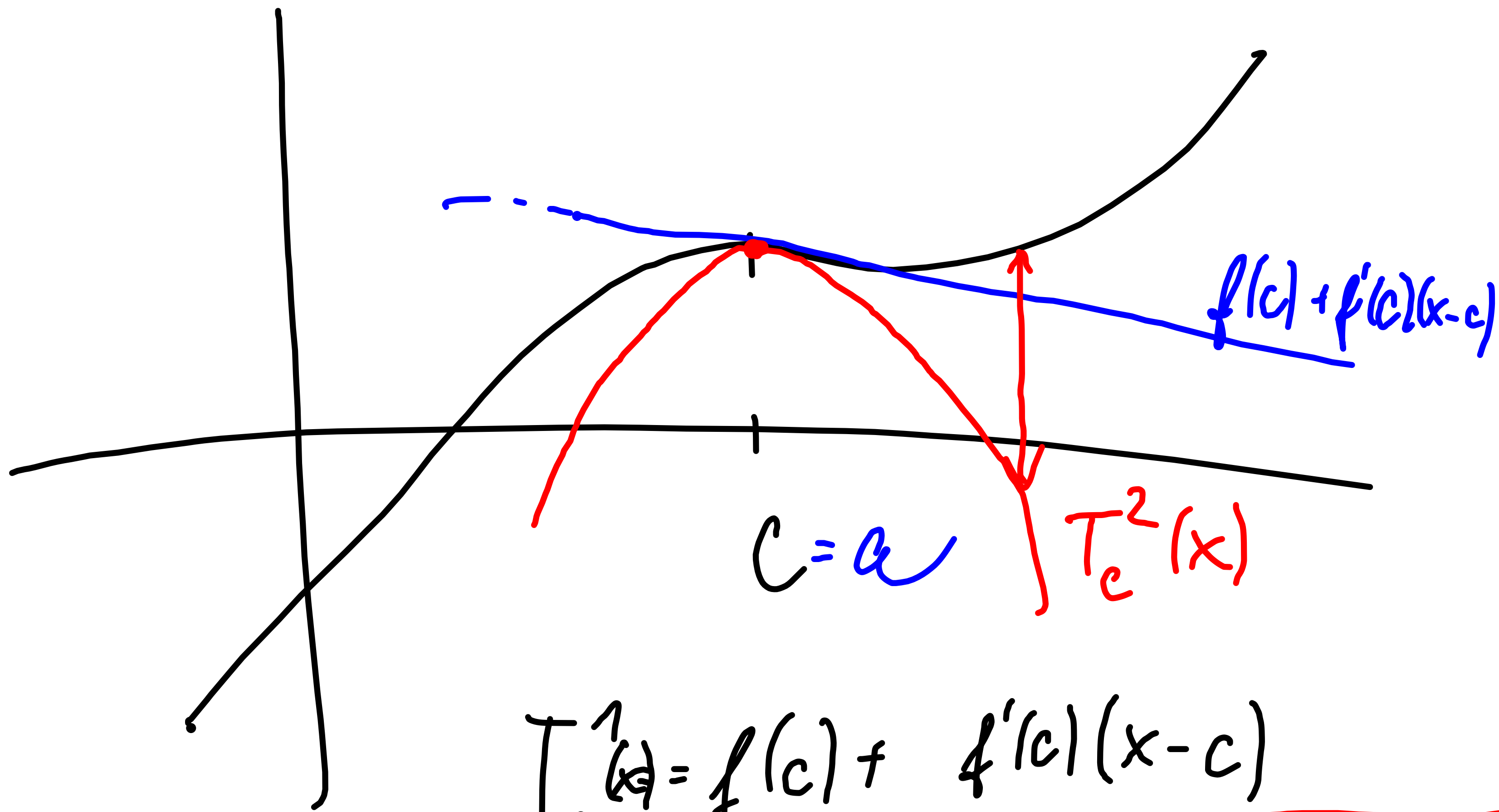
$$f'(x) = \sum_{i=1}^{\infty} i a_i x^{i-1} \Rightarrow$$

$$\Rightarrow f'(0) = a_1$$

$$f(x) = a_0 + a_1 x + a_2 x^2 + a_3 x^3 + a_4 x^4 + \cdots$$

$$f'(x) = a_1 + 2a_2 x + 3a_3 x^2 + 4a_4 x^3$$

$$f''(x) = 2a_2 + 6a_3 x + 12 a_4 x^2 + \cdots$$



$$T_c^1(x) = f(c) + f'(c)(x-c)$$

$$f(x) = T_a^k(x) + \boxed{\frac{1}{(k+1)!} f^{(k+1)}(b)(x-a)^{k+1}}$$

$$b \in (a, x)$$