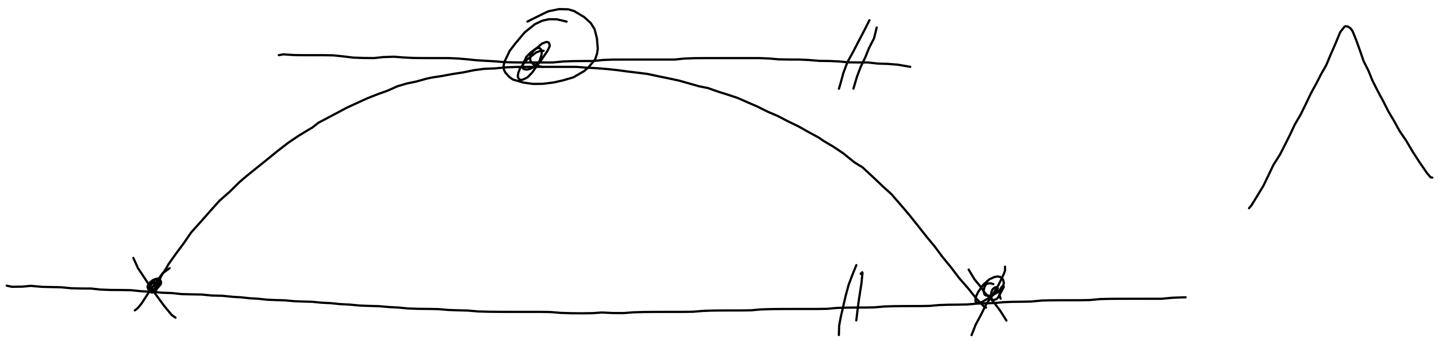
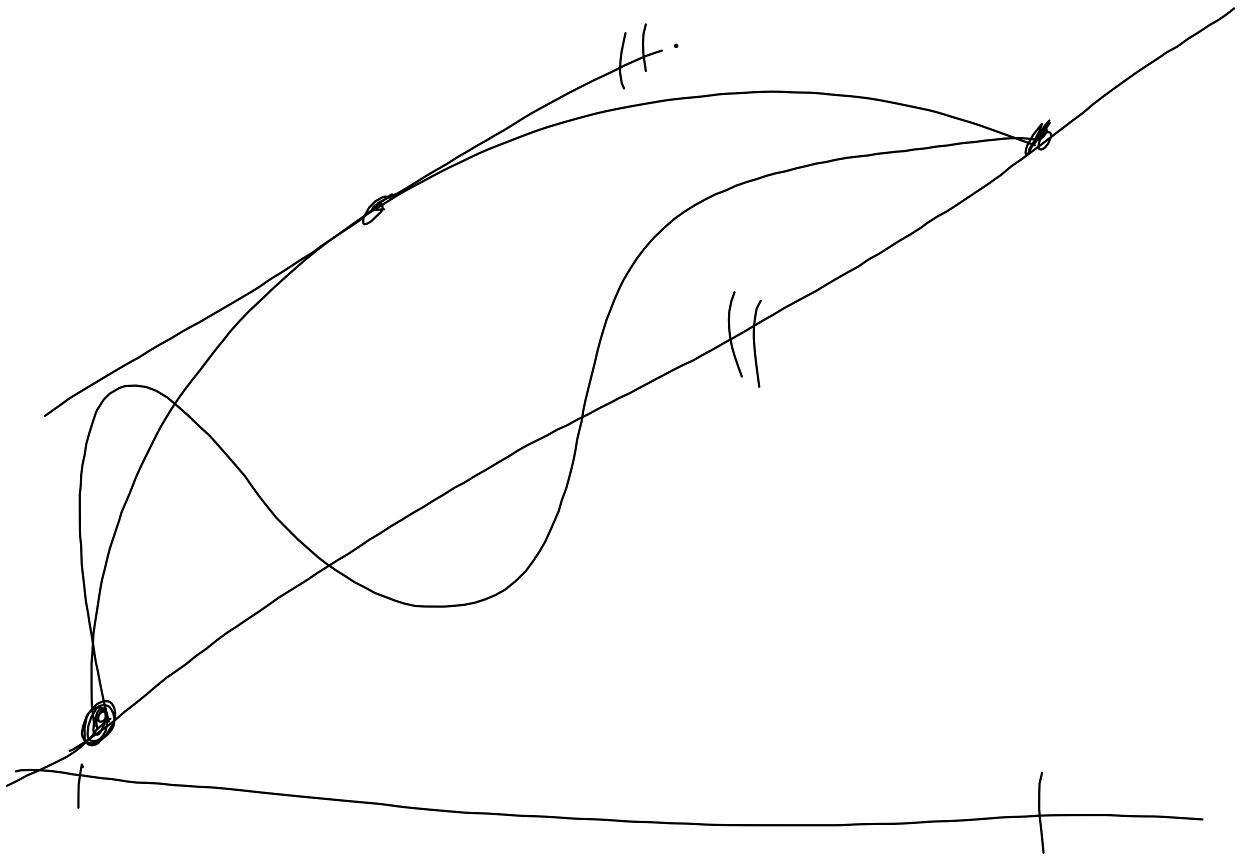
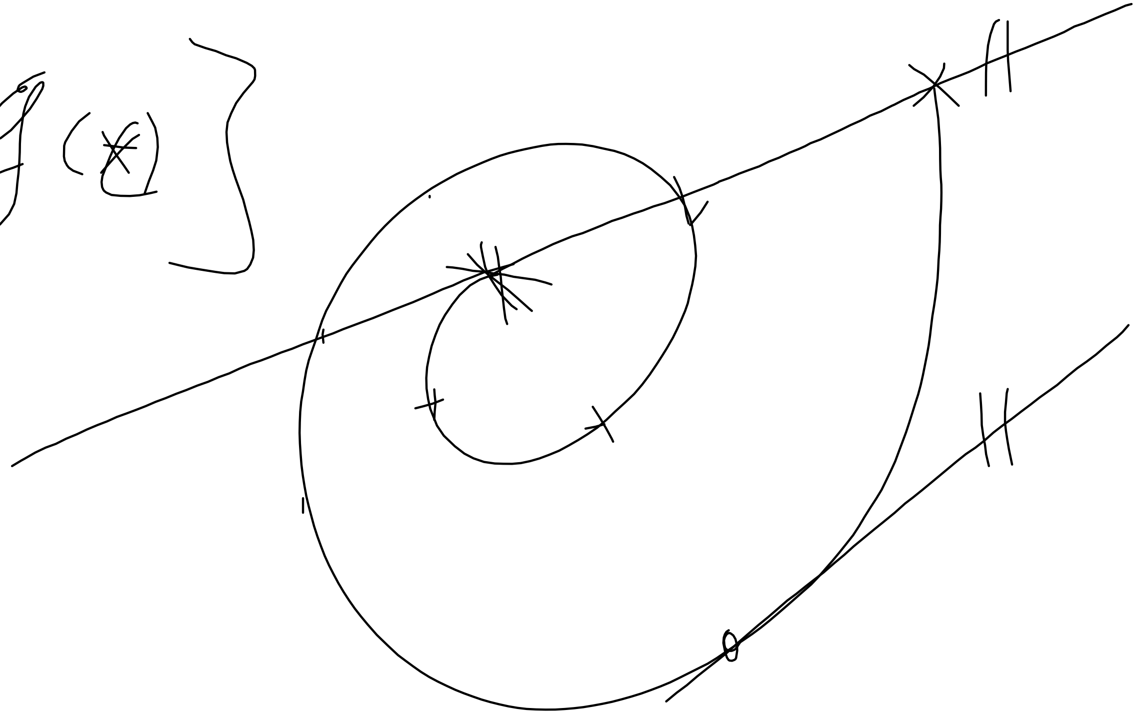
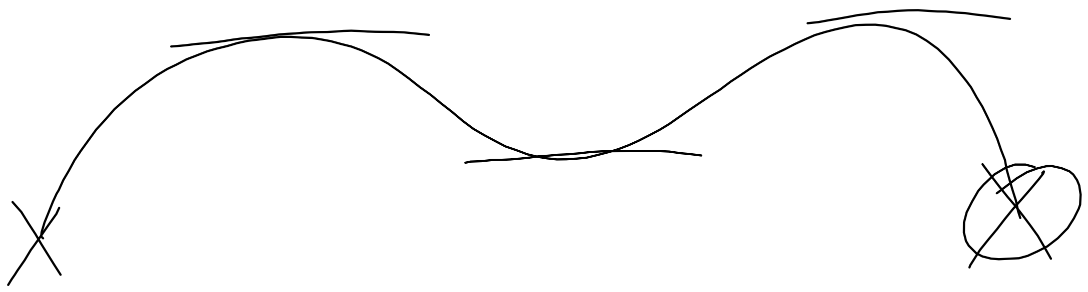
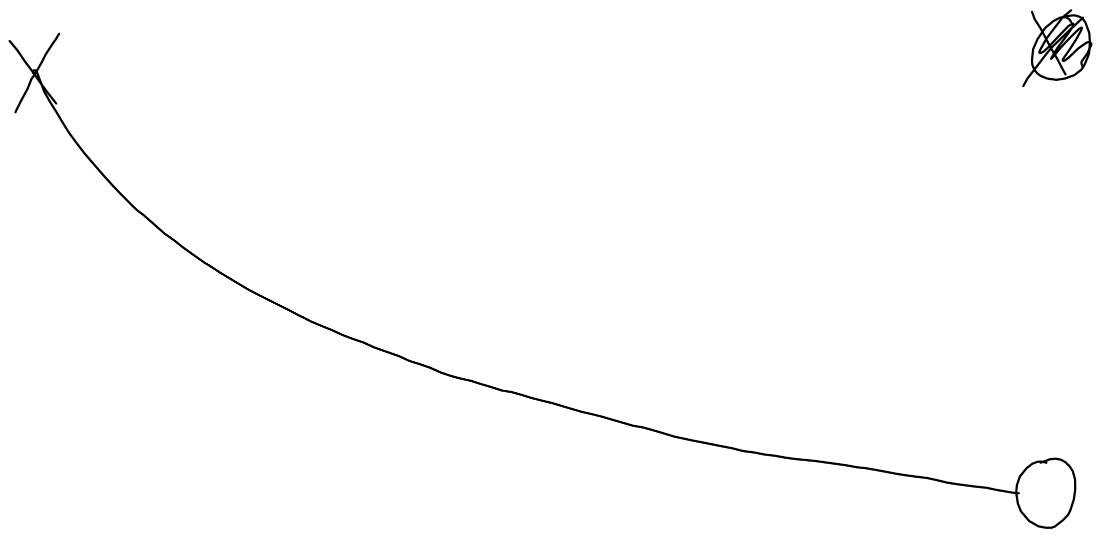


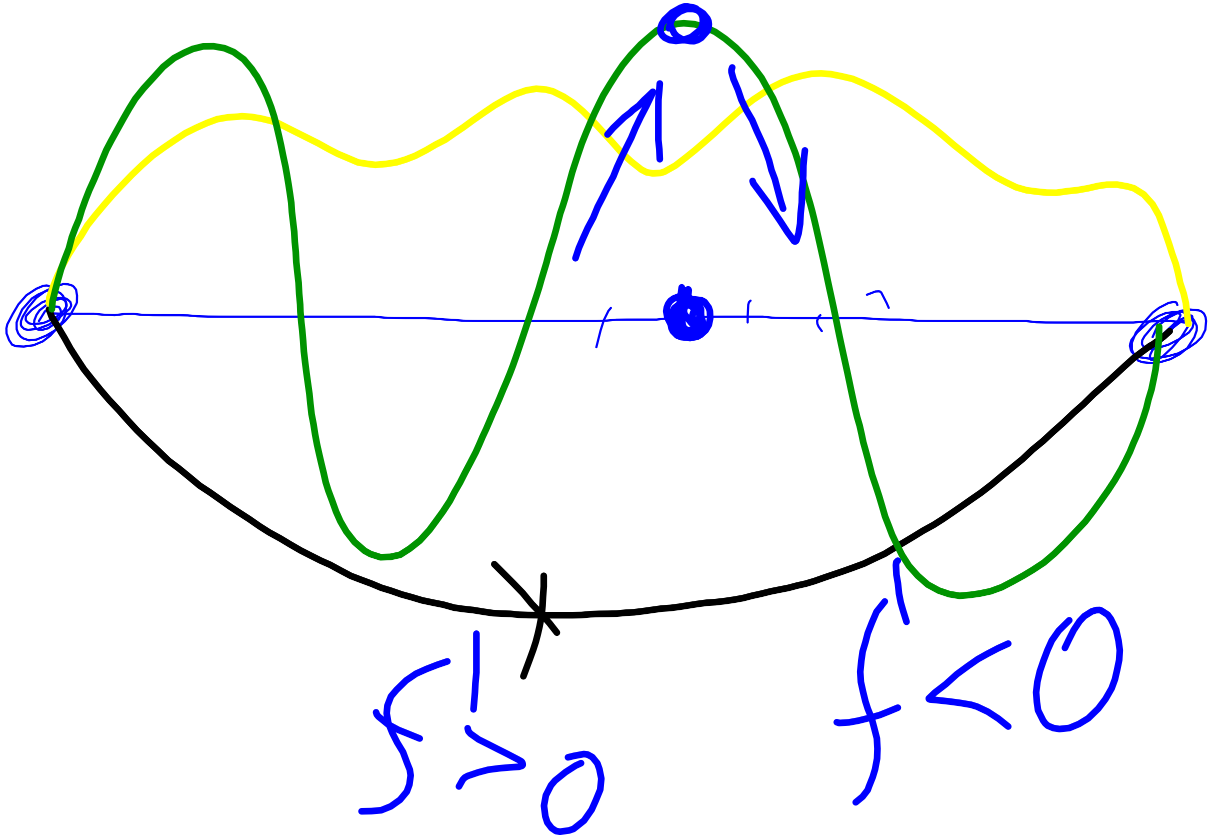


$[f(x), g(x)]$

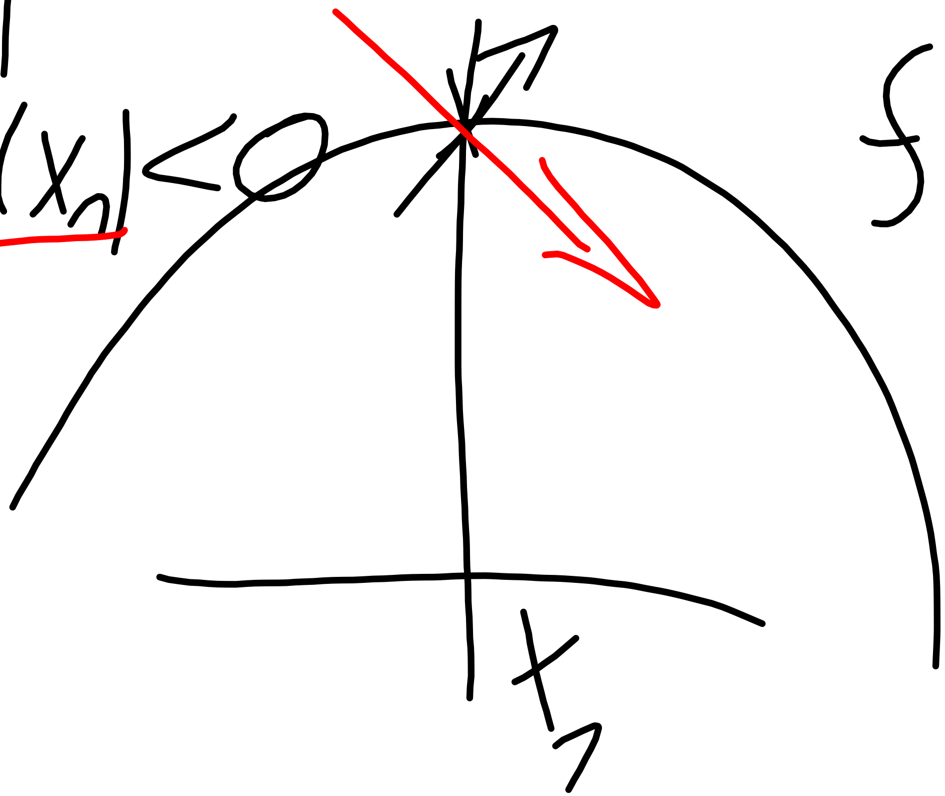




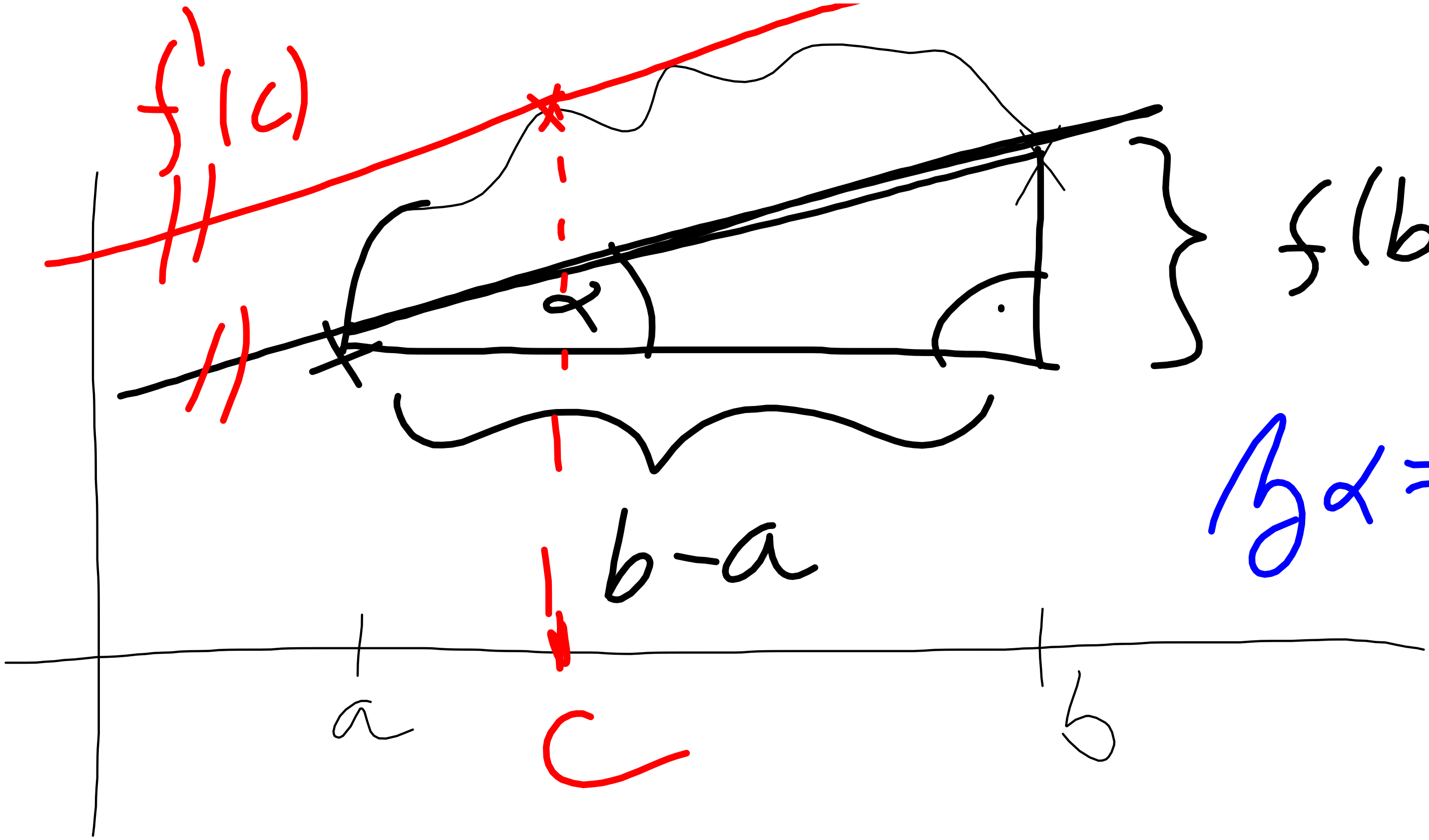



f' > 0
f' < 0

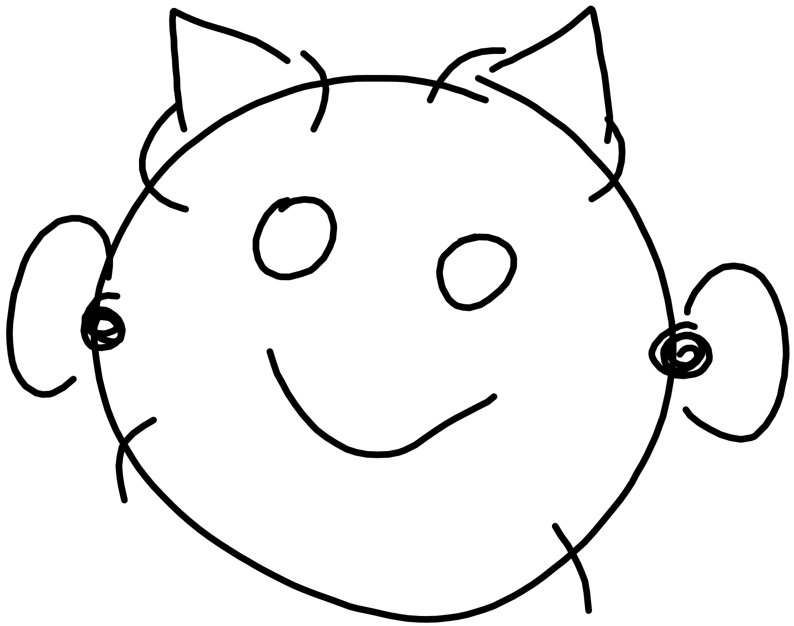
$f'(x_1) < 0$



$f'(x_1) > 0$



$$tg\,\alpha = \frac{f(b)-f(a)}{b-a}$$

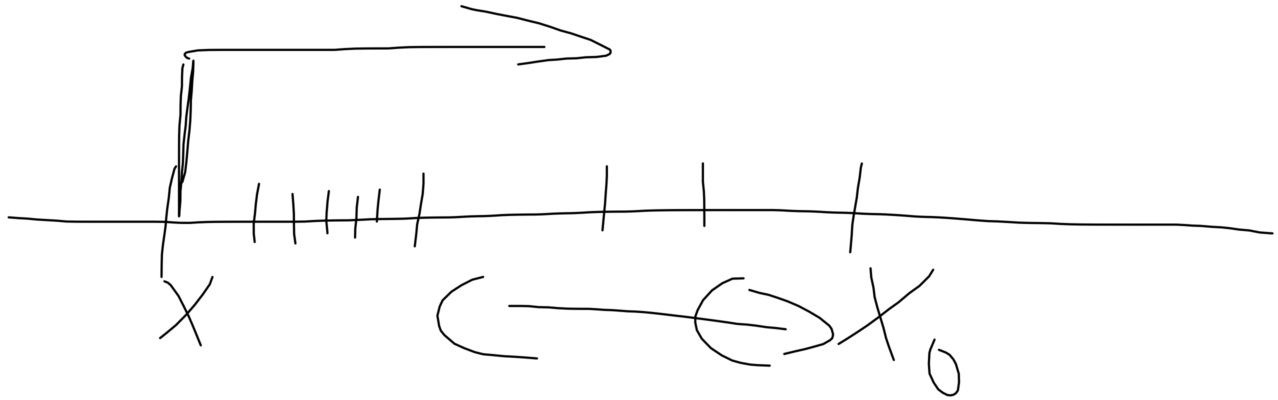


$g(c)$

$g(x) = x$

$g'(x) = 1$

$g'(c) = 1$


x
x₀

$$\lim \frac{f}{g} = \left| \frac{17}{\infty} \right| = 0$$

$$\left(\frac{1}{g(x)}\right)' = \left(g^{-1}(x)\right)' = (-1) \cdot g^{-2}(x) \cdot g'(x)$$

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

$$-\frac{1}{x} \le \frac{\sin x}{x} \le \frac{1}{x}$$

$$\begin{array}{ccc} \downarrow & \qquad\qquad & \downarrow \\ 0 & & 0 \end{array}$$

$$\lim \frac{f}{g} = \lim \frac{\frac{1}{g}}{\frac{1}{f}}$$

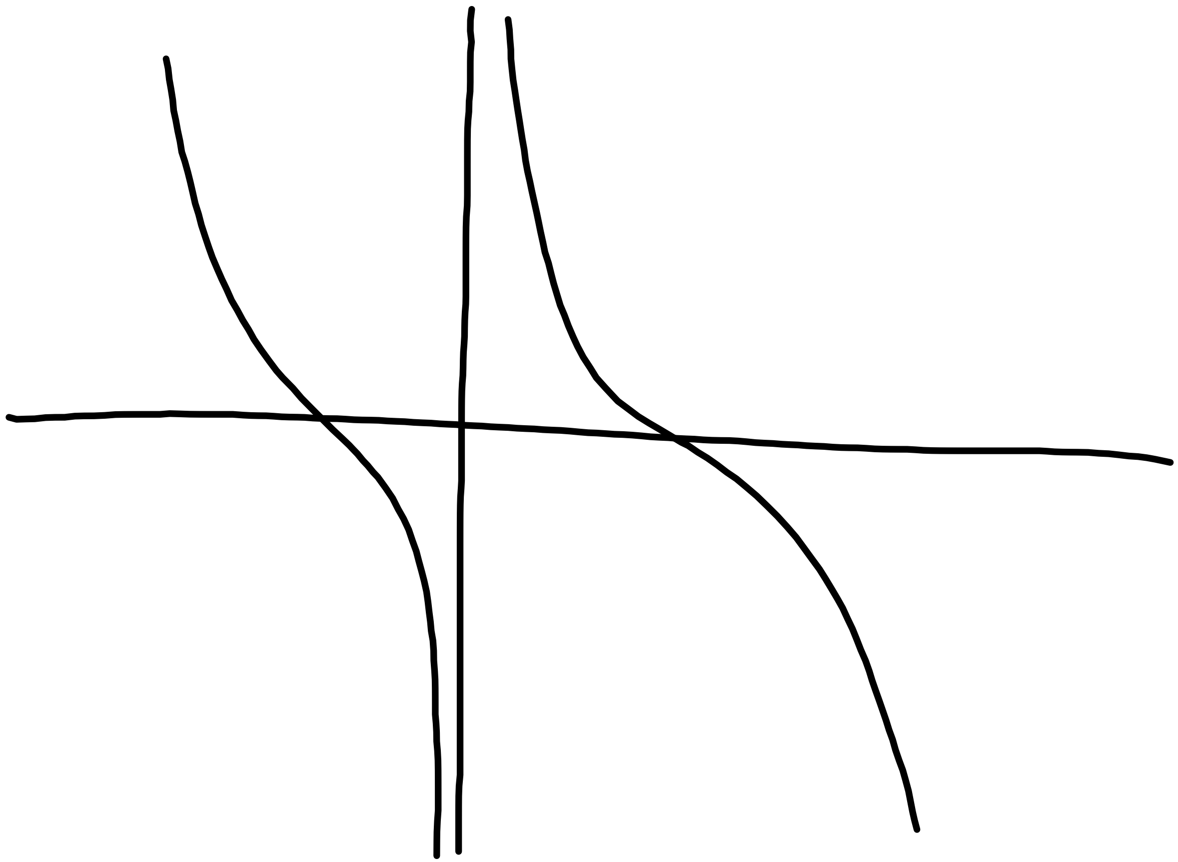
$$f^g$$

$$f \to 1$$

$$g \to \infty$$

$$\underset{\substack{\downarrow \\ 0}}{f} \cdot \underset{\substack{\downarrow \\ \infty}}{g} = \frac{f}{\frac{1}{g}} = \frac{g}{\frac{1}{f}}$$

$$f^g = e^{\ln f^g} = e^{g \cdot \ln f}$$



$$\frac{1}{x} - \operatorname{ctg} x = \frac{1 - x \cdot \operatorname{ctg} x}{x}$$

$$x \cdot \operatorname{ctg} x \xrightarrow{x \to 0^+} 0 \cdot (+\infty)$$

$$x \cdot \operatorname{ctg} x \xrightarrow{x \to 0^-} 0 \cdot (-\infty)$$

$$a^3 - b^3 = (a-b) \cdot (a^2 + ab + b^2)$$

$$\sqrt[4]{m^2} - \sqrt[3]{m}$$

$$a^{12} - b^{12} = (a-b) \cdot (\dots)$$

$$x^{\sin x} = e^{\ln x^{\sin x}}$$

$$\begin{array}{ccc} \dfrac{\sin x}{x} & \cdot & \sin x \\ \downarrow & & \downarrow \\ 1 & & 0 \end{array}$$

$$\lim_{x \to 0} \frac{x}{\sin x} = \lim_{x \to 0} \frac{1}{\frac{\sin x}{x}} =$$

$$= \frac{\lim_{x \to 0} 1}{\lim_{x \to 0} \frac{\sin x}{x}} = \frac{1}{1} = 1$$