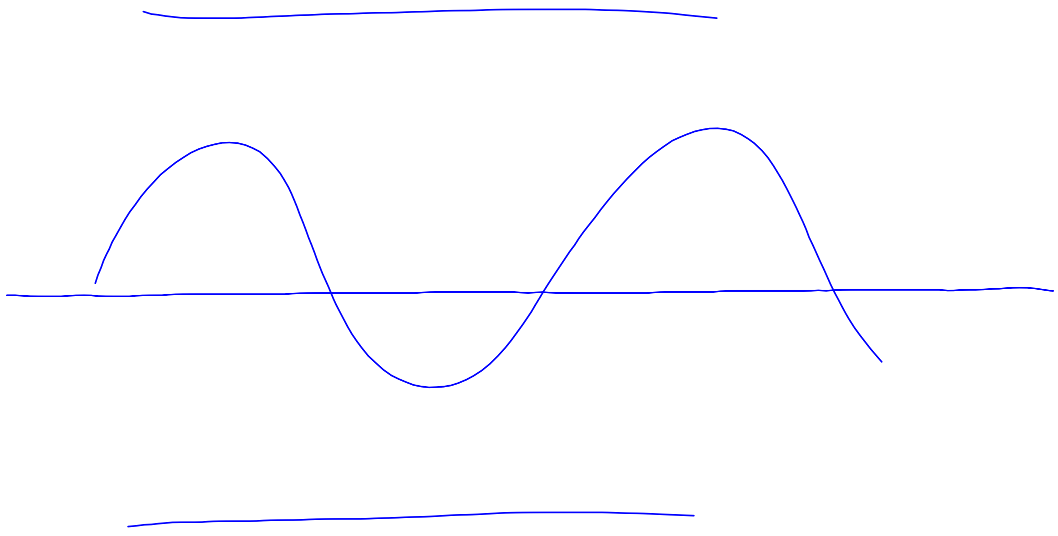
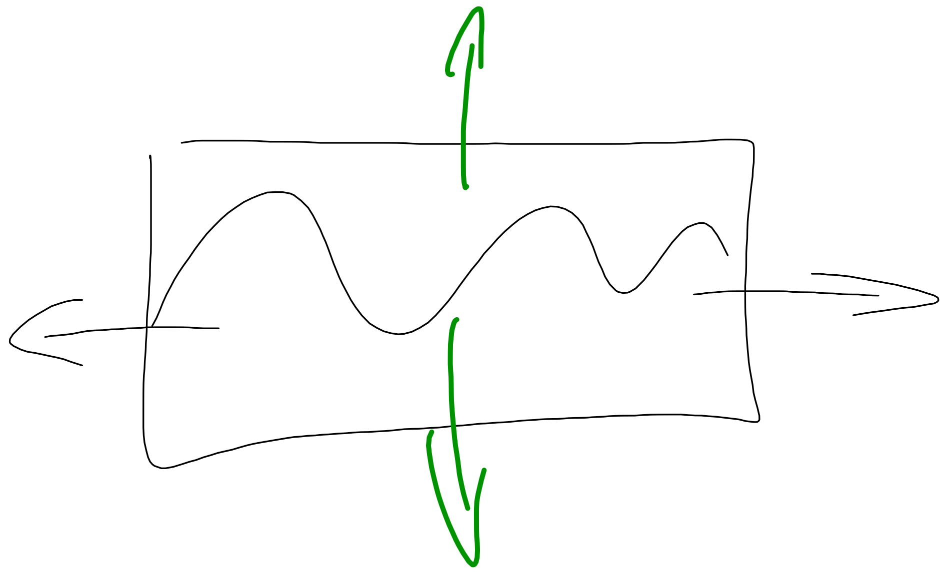


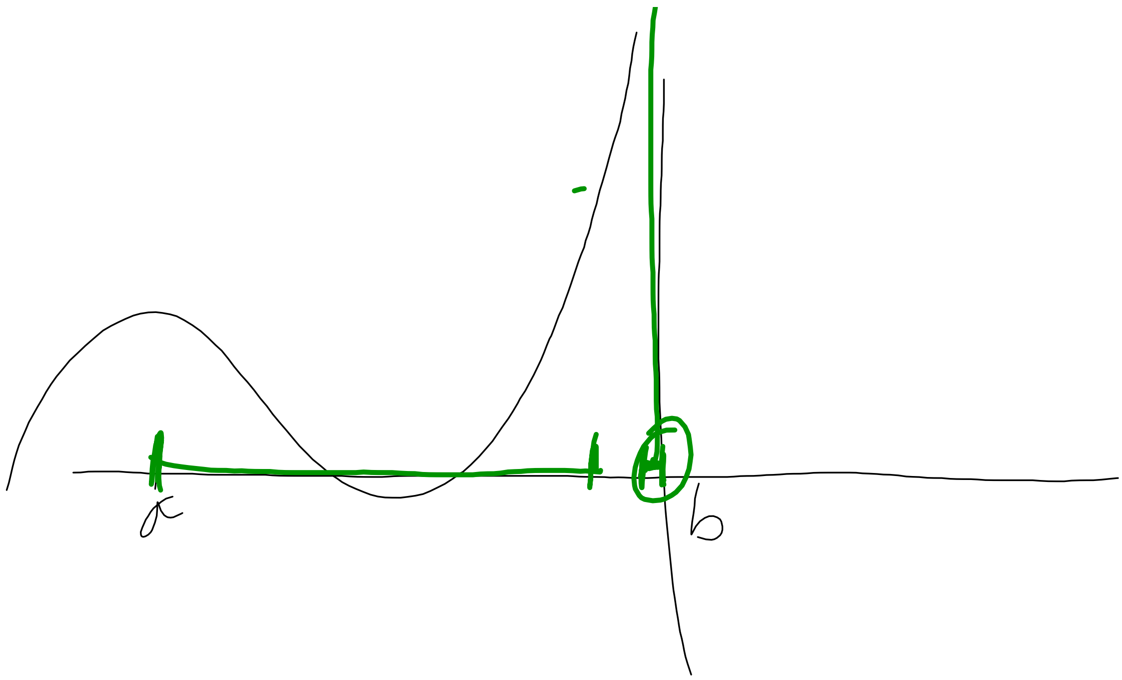
$$\frac{\varepsilon}{2} + \sum_{1}^{n_0} \cancel{2K} \cdot \frac{\varepsilon}{\cancel{4K} \cdot n_0} =$$

$$\sum_{i=1}^{n_0} \frac{\varepsilon}{2n_0} = \frac{\varepsilon}{2\cancel{n_0}} \cdot \cancel{n_0}$$

$$\sum_{i=1}^{5} i^2 = 1^2 + 2^2 + \dots + 5^2$$

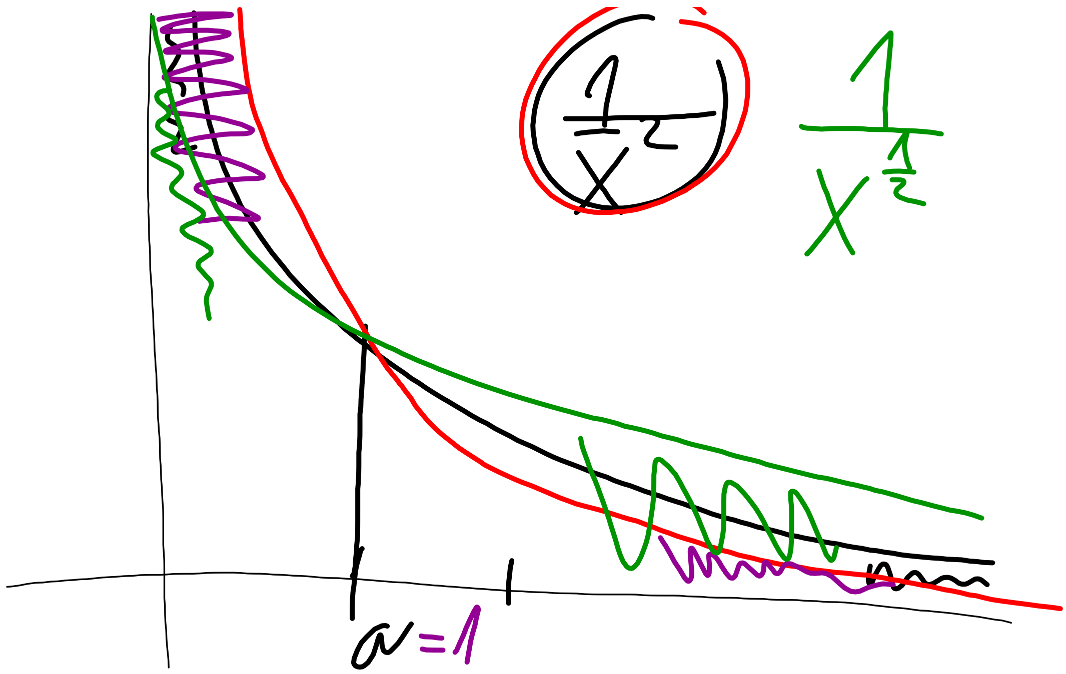
$$\sum_{i=1}^{5} 8 = 8 + 8 + 8 + 8 + 8$$



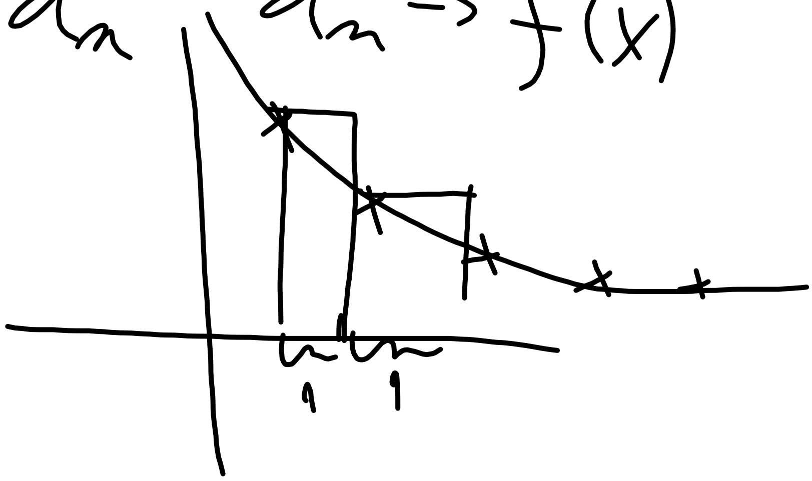

a
b

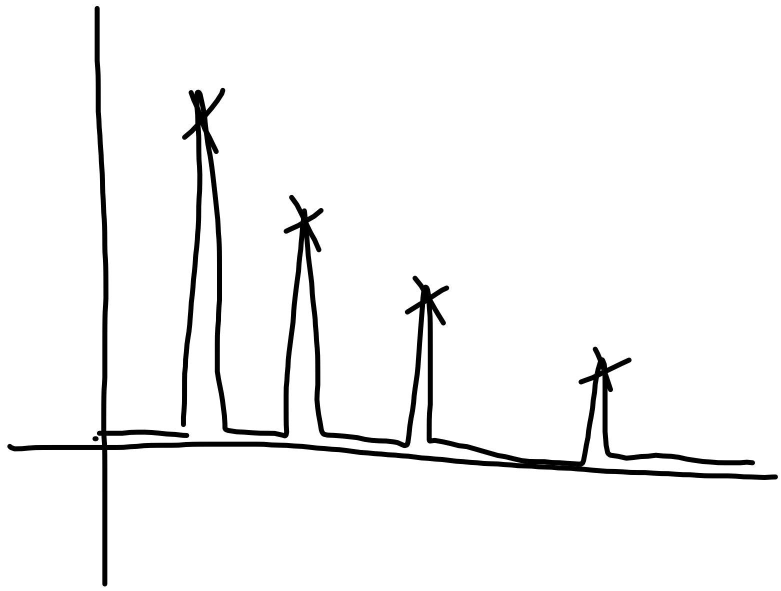
$$\int t^{-\alpha}\,dt = \left[\frac{t^{-\alpha+1}}{-\alpha+1}\right]$$

$$\underset{<0}{\frac{1}{1-\alpha}} \cdot \left(\underbrace{1-\frac{1}{0^{+}}}_{-\infty}\right) = +\infty$$

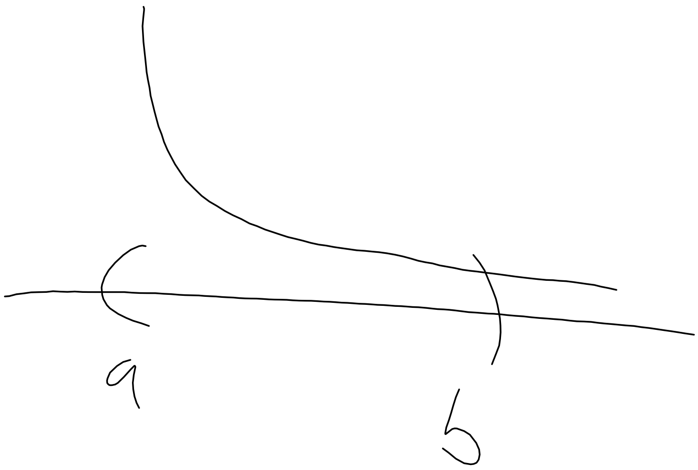

$\frac{1}{x^2}$
$\frac{1}{x^{\frac{1}{2}}}$
1
a=1

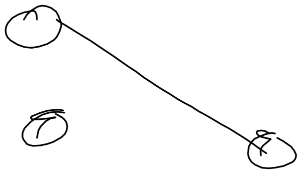
$$\sum_{n=1}^{\infty} a_n \qquad a_n \to f(x)$$





$$\int x^{-\frac{1}{2}} dx = \frac{x^{\frac{1}{2}}}{\frac{1}{2}} = 2 \cdot \sqrt{x}$$


a
b



$$\arcsin \Rightarrow -1 \le \frac{1-2x}{4} \le 1 \quad \Big/ \cdot 4$$

$$-4 \le 1-2x \le 4 \quad \Big/ -1$$

$$-5 \le -2x \le 3 \quad \Big/ \cdot \frac{1}{-2}$$

$$\frac{5}{2} \ge x \ge -\frac{3}{2}$$

$$t = 7^x \Rightarrow$$

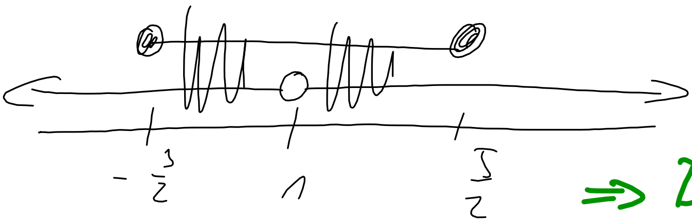
$$7 \cdot t - 3 \cdot t - 28 \ne 0$$

$$4t \ne 28$$

$$t \ne 7$$

$$7^x \ne 7^1$$

$$x \ne 1$$



$$\Rightarrow D(f) = \left[-\frac{3}{2}, 1\right) \cup \left(1, \frac{5}{2}\right]$$

$$\lim_{x \to 0} f(x) = f(0)$$

1.) $f(0) = 0 + 0 + 0 + 3 = 3$

2.) $\lim_{x \to 0^+} f(x) = \lim_{x \to 0^+} \left(3x^4 + 5x^3 - 2x + 3\right) = 3$

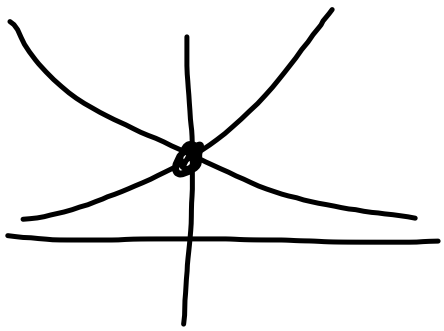
$\lim_{x \to 0^-} f(x) = \lim_{x \to 0^-} \left(\frac{2x}{x} + \frac{\sin x}{x}\right) = 2 + 1 = 3$

$$\lim_{x \to 0} f(x) = 3 = f(0) \checkmark$$

$x^3 \in [-1,1]$ tj. $x \in [-1,1]$

$\boxed{e^x - e^{-x} \neq 0}$ tj. $x \neq 0$

$D(f) = [-1,1] \setminus \{0\}$



$/ \cdot e^x \Rightarrow e^{2x} - 1 \neq 0$

$e^{2x} \neq 1 = e^0$

$2x \neq 0$

$x \neq 0$

$$f(-x) = \frac{|\sin(-x)| \cdot \arcsin(-x)^3}{e^{(-x)} - e^{-(-x)}} = \frac{|-\sin x| \cdot (-\arcsin x^3)}{e^{-x} - e^{x}} =$$

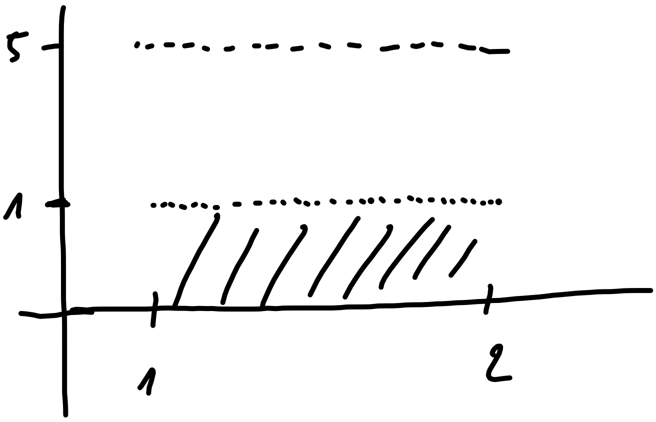
$$= - \frac{|\sin x| \cdot \arcsin x^3}{e^{-x} - e^{x}} = \frac{|\sin x| \cdot \arcsin x^3}{e^{x} - e^{-x}} = f(x)$$

$\Rightarrow$ SUDÁ

$(f' \circ g)(x) > 0$, $(f'' \circ g)(x) > 0 \Rightarrow (f \circ g)(x)$ kx

$f'' > 0,\ g'' > 0$

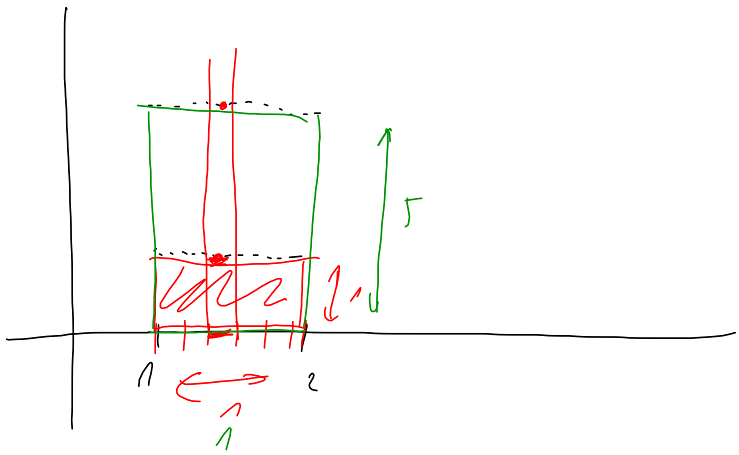
$$\left(f(g(x))\right)'' = \left(f'(g(x)) \cdot g'(x)\right)' = \overbrace{f''(g(x))}^{>0}\ \overbrace{g'(x) \cdot g'(x)}^{(g')^2 > 0} + \underbrace{f'(g(x))}_{>0} \cdot \underbrace{g''(x)}_{>0} > 0$$



$$\int_1^2 1\,dx = [x]_1^2 = 2-1=1$$

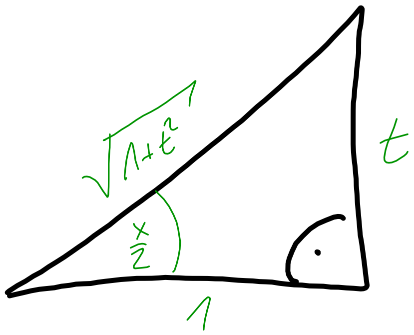
$$\int_1^2 5\,dx = [5x]_1^2 = 10-5 = 5$$

$$f(x) = \begin{cases} 1, & x \in \boxed{\mathbb{Q}} \\ 5, & x \in \boxed{\mathbb{I}} \end{cases} \Rightarrow \begin{array}{l} \int_1^2 f(x)\,dx = 5 \\ \int_1^5 f(x)\,dx = 1 \end{array}$$



5
1
2
1
1

$$\int \frac{1}{2-\cos x}\,dx = \left|\begin{array}{l} \boxed{t = \operatorname{tg}\frac{x}{2}} \\ \operatorname{arctg} t = \frac{x}{2} \\ x = 2\cdot\operatorname{arctg} t \end{array}\right| \left.\begin{array}{l} 1\,dx = 2\cdot\frac{1}{1+t^2}\,dt \\ \cos x = \frac{1-t^2}{1+t^2} \end{array}\right| = \int \frac{1}{2-\frac{1-t^2}{1+t^2}}\cdot 2\cdot\frac{1}{1+t^2}\,dt =$$



$$\sin\frac{x}{2} = \frac{t}{\sqrt{1+t^2}}$$

$$\cos\frac{x}{2} = \frac{1}{\sqrt{1+t^2}}$$

$$\left(\sin x = 2\cdot\sin\frac{x}{2}\cdot\cos\frac{x}{2}\right)$$

$$\cos x = \cos^2\frac{x}{2} - \sin^2\frac{x}{2} = \frac{1}{1+t^2} - \frac{t^2}{1+t^2} = \frac{1-t^2}{1+t^2}$$

$$= \int \frac{1}{\frac{2(1+t^2)-(1-t^2)}{1+t^2}} \; \frac{2}{1+t^2}\, dt = \int \frac{\cancel{1+t^2}}{2+2t^2-1+t^2} \cdot \frac{2}{\cancel{1+t^2}}\, dt =$$

$$= \int \frac{2}{3t^2+1}\, dt = \int \frac{2}{(\sqrt{3}\,t)^2+1}\, dt = \left| \begin{array}{l} u = \sqrt{3}\,t \\ \underline{du = \sqrt{3}\,dt} \end{array} \right| =$$

$$\boxed{(\operatorname{arctg} u)' = \frac{1}{u^2+1}}$$

$$= 2 \cdot \int \frac{1}{u^2+1}\, \frac{1}{\sqrt{3}}\, du = \frac{2}{\sqrt{3}} \cdot \operatorname{arctg} u + C =$$

$$= \frac{2}{\sqrt{3}} \cdot \operatorname{arctg}\left(\sqrt{3} \cdot \operatorname{tg} \frac{x}{2}\right) + C$$

$$V = \pi \cdot \int_a^b f(x)^2 \, dx = \pi \cdot \int_{\frac{\pi}{3}}^{\frac{13\pi}{6}} \left(1 + \frac{\sin(3x)}{2}\right)^2 dx = \pi \cdot \int_{\frac{\pi}{3}}^{\frac{13\pi}{6}} 1 + \sin(3x) + \frac{\sin^2(3x)}{4} \, dx$$

$$= \pi \cdot \left[x - \frac{\cos(3x)}{3} + \frac{1}{4} \cdot \left(\frac{x}{2} - \frac{\sin 6x}{12} \right) \right]_{\frac{\pi}{3}}^{\frac{13\pi}{6}} = \ldots = \underline{\underline{\frac{33}{16}\pi^2 - \frac{\pi}{3}}}$$

$$\int \sin(3x) \, dx = \left| \begin{array}{l} t = 3x \\ dt = 3\,dx \\ dx = \frac{1}{3} dt \end{array} \right| = \int \sin t \cdot \frac{1}{3} dt = \frac{1}{3} \cdot (-\cos t) + C = \frac{-\cos(3x)}{3} + C$$

$$\int \sin^2(3x)\,dx = \left| \begin{array}{l} \sin^2\frac{\alpha}{2} = \frac{1-\cos\alpha}{2} \\ \sin^2(3x) = \frac{1-\cos(6x)}{2} \end{array} \right| = \int \frac{1-\cos(6x)}{2}\,dx =$$

$$= \frac{1}{2}\cdot \int 1-\cos(6x)\,dx = \frac{1}{2}\cdot\left(x - \frac{\sin(6x)}{6}\right) + C$$

$$\int \cos(6x)\,dx = \left| \begin{array}{l} v = 6x \\ dv = 6\,dx \end{array} \right| = \dots$$

x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\sin x$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{4}}{2}$