$$P(x) = 4x^5 - 2x + 1$$

$$\begin{array}{c|cccccc} & 4 & 0 & 0 & 0 & 2 & 1 \\ \hline 0 & & & & & & \end{array}$$

$$P(x) = 6x^7 + \ldots + 15$$

$$15 \Rightarrow \pm 1, \pm 3, \pm 5, \pm 15$$

$$6 \Rightarrow 1, 2, 3, 6$$

$$\mathbb{Q}: \quad \frac{\pm 1}{1}, \frac{\pm 3}{1}, \ldots, \frac{\pm 15}{6}$$

$$\frac{P(x)}{x-6} = \boxed{Q(x)}$$

$$P(x) = 4x^8 - 2x^5 + 2x^2 - x$$

$$= (x-0)\cdot(4x^7 - \ldots\ldots - 1)$$

$$\frac{x^2+3x-2}{(x+3)^3} = \frac{A}{(x+3)^3} + \frac{B}{(x+3)^2} + \frac{C}{x+3} \quad \Big| \cdot (x+3)^3$$

$$x^2+3x-2 = A + B\cdot(x+3) + C\cdot(x+3)^2 \quad (*)$$

x^0: $-2 = A + 3B + 9C$

x^1: $3 = B + 6C$

x^2: $1 = C$

$\boxed{x = -3} \Rightarrow 9 - 9 - 2 = A + B \cdot 0 + C \cdot 0$

$A = -2$

$$\frac{1}{a_n} \cdot \frac{\qquad}{(x-3)^3 \cdot x^5 \cdot (x^2+x+1)^2}$$

$$\underbrace{\frac{P(x)}{(x-\alpha)^k \cdot Q(x)} - \frac{A}{(x-\alpha)^k}}_{\dfrac{P(x) - A \cdot Q(x)}{(x-\alpha)^k \cdot Q(x)}} + \frac{A}{(x-\alpha)^k}$$

$$\left. P(x) - \frac{P(\alpha)}{Q(\alpha)} \cdot Q(x) \right|_{x=\alpha} =$$

$$= P(\alpha) - \frac{P(\alpha)}{\cancel{Q(\alpha)}} \cdot \cancel{Q(\alpha)} = 0$$

$$\frac{Q_2(x)}{(x-\alpha)^{k-1} \cdot Q_1(x)}$$

$$\frac{P(x)}{x^2 \cdot (x-3) \cdot (x+4)^3} = \frac{A}{x^2} + \frac{B}{x} + \frac{C}{x-3} + \frac{D}{(x+4)^3} + \frac{E}{(x+4)^2} + \frac{F}{(x+4)}$$

$$\frac{P(x)}{(x-1)^2(x+5)\cdot(x^2+1)^3\cdot(x^2+x+1)} =$$

$$= \frac{A}{(x-1)^2} + \frac{B}{(x-1)^1} + \frac{C}{x+5} + \frac{Dx+E}{(x^2+1)^3} +$$

$$+ \frac{Fx+G}{(x^2+1)^2} + \frac{Hx+I}{x^2+1} + \frac{Jx+K}{x^2+x+1}$$

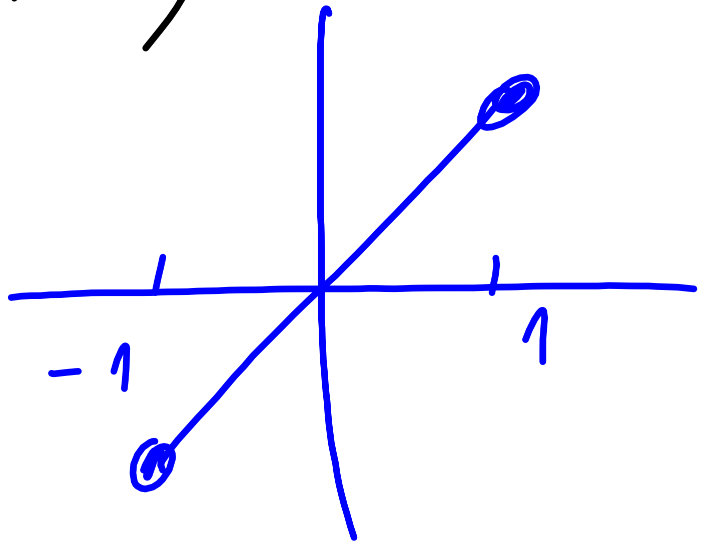
x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
$\sin x$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{4}}{2}$

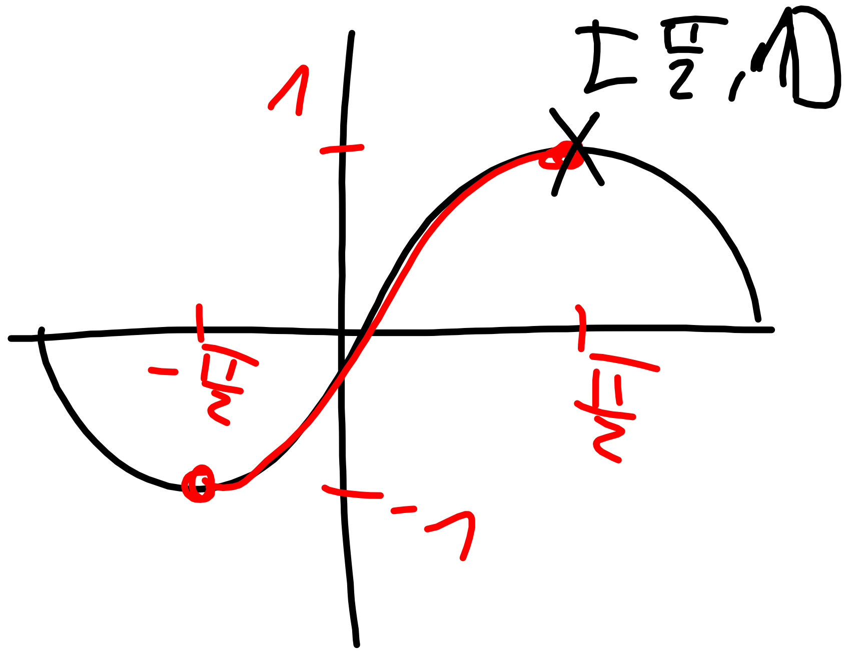
$$\sin^2 x = \frac{1-\cos 2x}{2} =$$

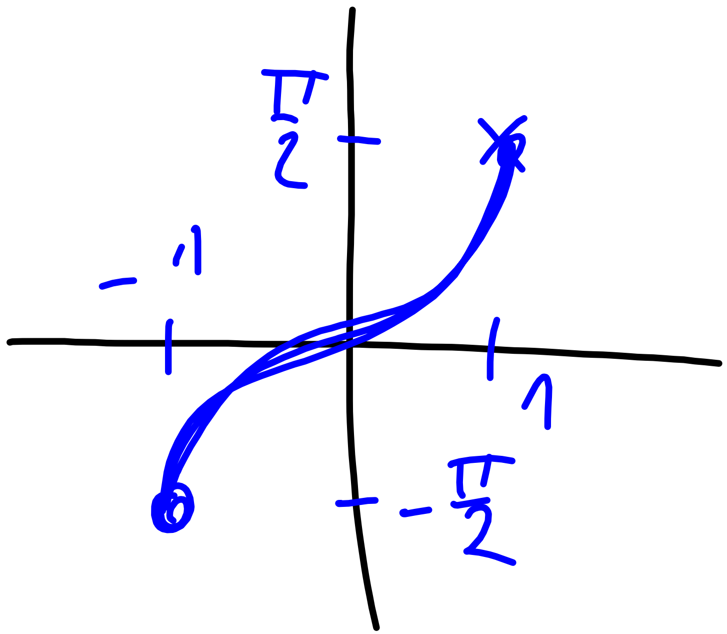
$$= \frac{1}{2} \cdot \left(1 - \cos 2x\right)$$

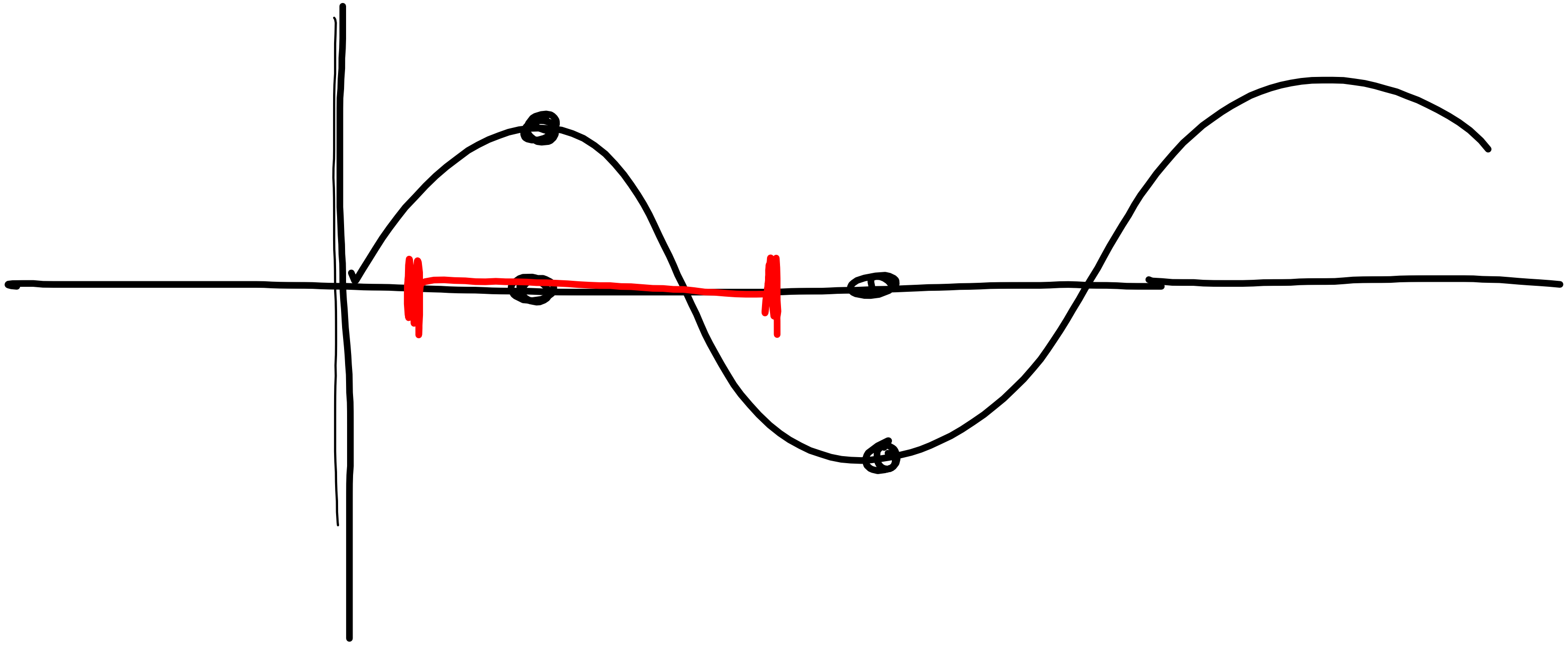
$f(x) = \sin(\arcsin x) = x$

$D(f) = [-1, 1]$




$[\frac{\pi}{2}, 1]$
1
-1
$-\frac{\pi}{2}$
$\frac{\pi}{2}$


$\frac{\pi}{2}$
-1
1
$-\frac{\pi}{2}$



$$x^3 \cdot x^2 = xxx \cdot xx = x^5$$

$$(x^3)^2 = xxx \cdot xxx = x^6$$

$$x^r = e^{\ln(x^r)} = e^{r \cdot \ln x}$$

$$\mathrm{id}\, x = x$$

$$\left(\sqrt{x}\right)^2 = x = \mathrm{id}(x)$$

$\chi(x)$ ______________________

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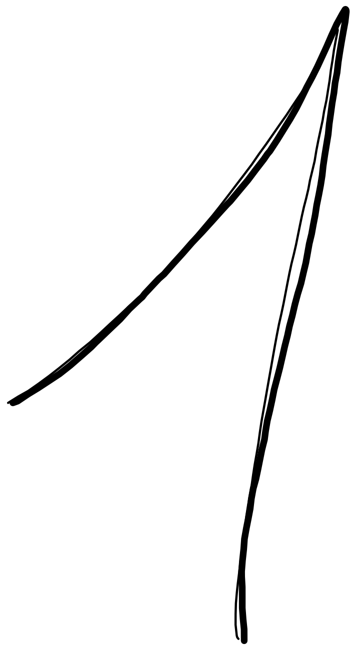
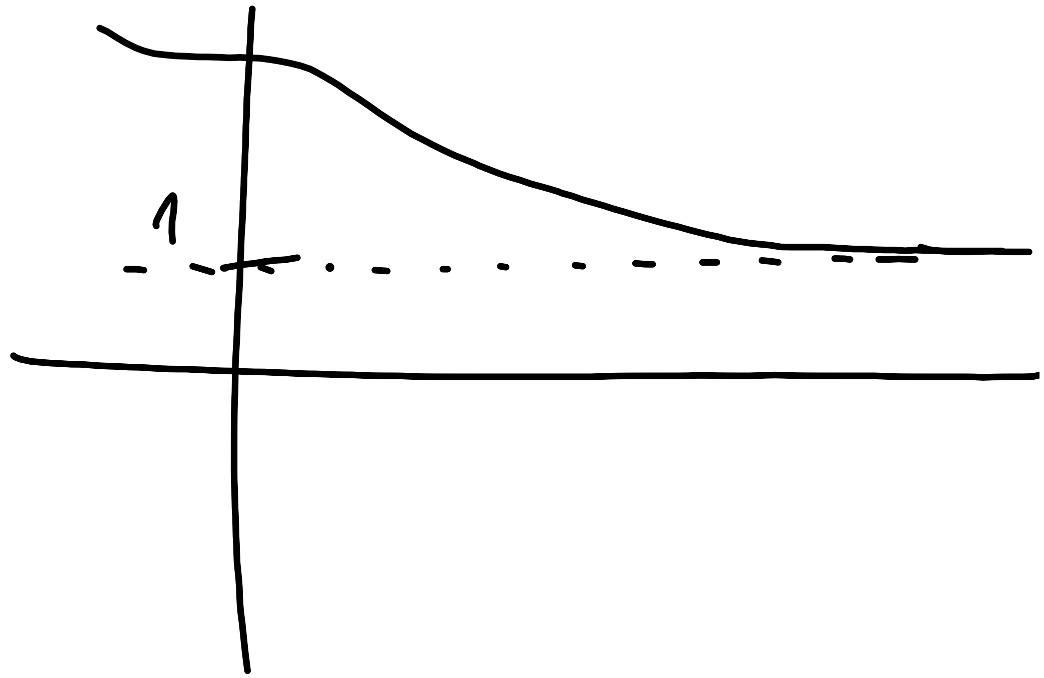



1

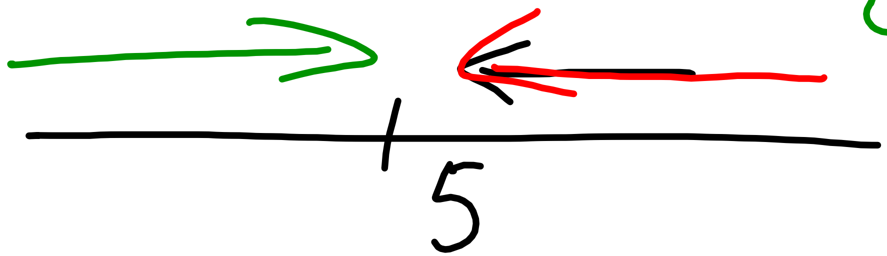
$$\frac{0}{0} \qquad\qquad \frac{x-5}{(x-5)^2} = \frac{1}{x-5}$$

$$\frac{(x-5)^2}{x-5} = x-5 = 0$$

$$\left.\frac{1}{x-5}\right|_{x=5}$$

$$\lim_{x\to 5^{\pm}} \frac{1}{x-5} = \frac{1}{5^{\pm}-5} = \frac{1}{0^{\pm}}$$

$$= -\infty \qquad = +\infty$$



$$\frac{1}{\frac{1}{1000}} = 1000$$