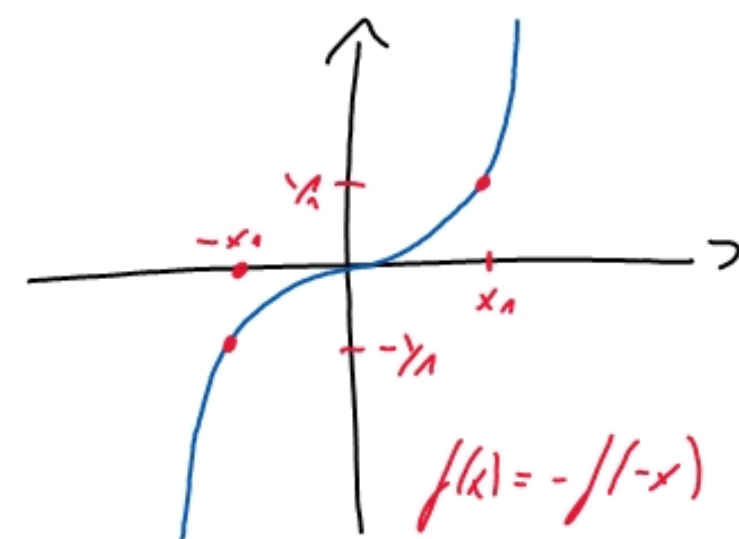


$$f(x) = f(-x)$$

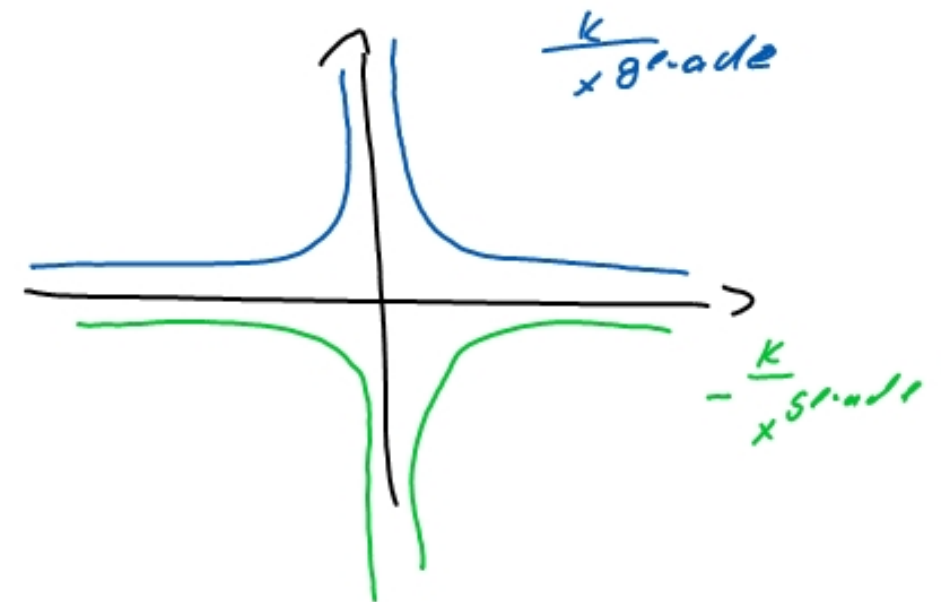
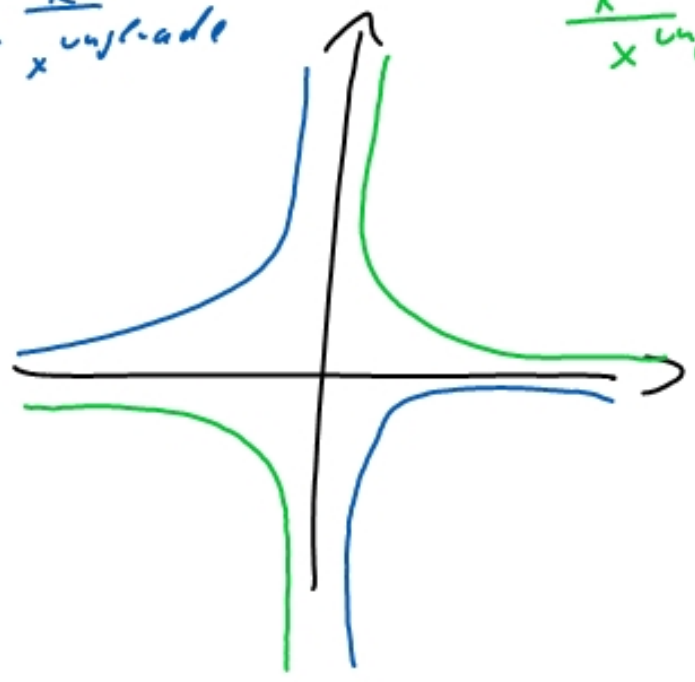


$$f(x) = -f(-x)$$

$\frac{k}{x}$ ungrade

$\frac{k}{x}$ ungrade

$\frac{k}{x}$ grade



$-\frac{k}{x}$ grade

1) 2) 3) a) I)

$$1) \sqrt[3]{\sqrt{a^4 \sqrt{a^3} \sqrt[3]{a^7}} a^2} = \left((a^4)^{\frac{1}{2}} \right)^{\frac{1}{3}} \left(\left((a^3)^{\frac{1}{2}} \right)^{\frac{1}{3}} \right)^{\frac{1}{3}} \left((a^7)^{\frac{1}{3}} \right)^{\frac{1}{3}} a^2$$

$$a^{2 \cdot \frac{1}{3}} \cdot a^{\frac{1}{4}} \cdot a^{\frac{1}{18}} \cdot a^{\frac{2}{3}} = a^{\frac{24+9+2+24}{36}} = a^{\frac{59}{36}} = \sqrt[36]{a^{59}} (a^2)^{\frac{1}{3}}$$

$$2) \frac{3(2x^{-2}y^{-3})^2}{2^2(3a^3s^{-2})^3} \cdot \frac{2^3(3a^4s^{-3})^2}{3^2(2x^{-1}y^{-2})^3}$$

$$\frac{3 \cdot 2^2 x^{-4} y^{-6} \cdot 2^3 \cdot 3^2 a^8 s^{-6}}{2^2 \cdot 3^3 a^9 s^{-6} \cdot 3^2 \cdot 2^3 x^{-3} y^{-6}}$$

$$\frac{3^3 2^5}{3^5 2^5} \cdot \frac{a^8 s^6 x^3 y^6}{x^4 y^6 s^6 a^9} = \frac{1}{9} \cdot \frac{1}{ax}$$

$$3) \frac{42}{\sqrt[4]{x^{10}}} \cdot \frac{(\sqrt[4]{x^2})^{3-2n}}{\sqrt[2n]{x^{4n-6}}} \cdot \left(\frac{(\sqrt[4]{x})^{2n+1}}{\sqrt[2]{x^{6-n}}} \right)^2$$

$$\frac{42 \cdot x^{\frac{6-4n}{4}}}{x^{\frac{10}{4}}} \cdot \frac{x^{\frac{4n-6}{2n}}}{x^{\frac{2n-3}{n}}} \cdot \frac{x^{\frac{4n+10}{4}}}{x^{\frac{2n-4n}{2}}}$$

$$42 \cdot x^{\frac{-10 + (6-4n) - (2n-3) + (4n+10) - (2n-4n)}{4}}$$

$$42 \cdot x^{\frac{-15 + 2n}{4}}$$

$$a) (\sqrt[12]{x^6})^3 = 64$$

$$((x^6)^{1/12})^3 = 2^6$$

$$x^{3/12} = 2^6 \quad | \uparrow^{2/3}$$

$$x = (2^6)^{2/3} = 2^4 = 16$$

$$\bar{I} \quad f(x) = 3 \sqrt{\frac{3}{x-2}}$$

$$\mathbb{D} = x \in \mathbb{R} \setminus \{2\}$$

$$\mathbb{W} = y \in \mathbb{R} \setminus \{0\}$$

$$a^x = b \quad | \log$$

$$a^x = b \Leftrightarrow x = \log_a b$$

$$x \cdot \log(a) = \log(b) \quad | : \log(a)$$

$$x = \frac{\log(b)}{\log(a)}$$

$$x = \log_{10} 100.000$$

$$10^x = 100.000 = 10^5$$

$$x = 5$$

$$x = \log_2 0,125 = \log_2 \frac{1}{8}$$

$$2^x = \frac{1}{8} = 2^{-3}$$

$$x = -3$$

$$2) \quad 2 \cdot \ln 2x - 3 \cdot \ln 2 + 4 \cdot \ln \sqrt{x} + 2 \cdot \ln \frac{4}{x^2}$$

$$\ln (2x)^2 - \ln 2^3 + \ln (\sqrt{x})^4 + \ln \left(\frac{4}{x^2}\right)^2$$

$$\ln \frac{4 \cdot x^2 \cdot x^2 \cdot \frac{16}{x^4}}{8} = \ln 8$$

$$4) \quad \ln \left(\frac{2 \cdot \sqrt{a-25}}{c^2 \cdot 4\sqrt{d}} \right)^3 = 3 \cdot \left(\ln 2 + \ln (a-25)^{\frac{1}{2}} - \ln c^2 - \ln d^{\frac{1}{4}} \right)$$

$$= 3 \cdot \ln 2 + \frac{3}{2} \cdot \ln (a-25) - 6 \ln c - \frac{3}{4} \ln d$$