$$(2^8)^{1/4} = 2^{8 \cdot 1/4} = 2^2$$

$$\log(256x^8)^{1/4} - \lg\left(\frac{\sqrt{9}}{x^2}\right)^2 - \log\left(\frac{x^4}{9}\right)^{1/2}$$

$$= \lg(9x^4)^{3/2} + \lg\left(\tfrac{1}{2}x^3\right)^3 + \lg\sqrt{27x}^{\,4}$$

$$\log 4x^2 - \log \tfrac{9}{x^4} - \lg \frac{x^2}{3} = \log(27x^6) + \lg \frac{1}{8x^9} + \lg 27^2 x^2$$

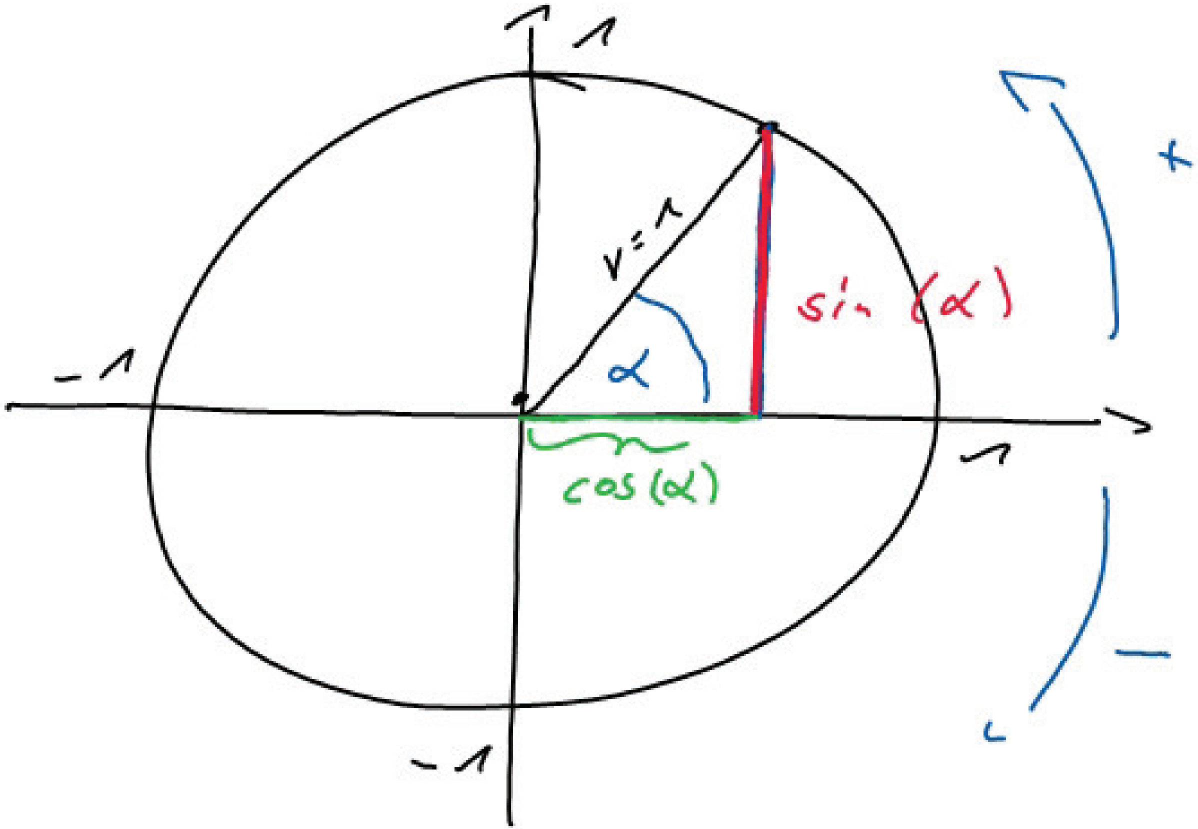
$$\log \frac{1}{8x^9} + \log 3^6 x^2$$

$$\log \frac{4x^2}{\frac{9}{x^4} \quad \frac{x^2}{3}} = \log \frac{27x^6 \quad \frac{1}{8x^9} \quad 3^6 \cdot x^2}{1}$$

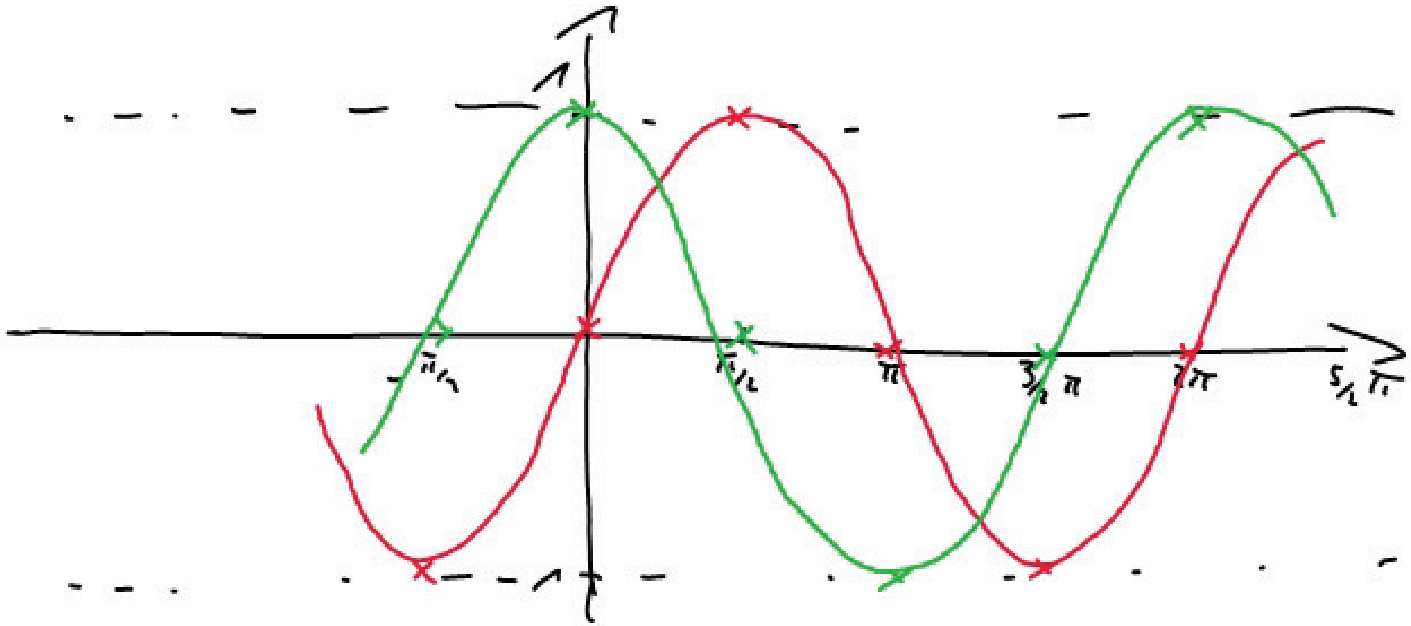
$$\frac{4x^2 \cdot x^4 \cdot 3}{9 \cdot x^2} = \frac{27 \cdot x^6 \cdot 3^6 \cdot x^2}{8x^9}$$

$$\frac{4x^4}{3} = \frac{3^9}{8x} \Rightarrow x^5 = \frac{3^{10}}{2^5} \Rightarrow x^{9/2}$$

Trigonometrie



Funktion



Additionstheorem:

$$\sin(\alpha+\beta) = \sin(\alpha)\cdot\cos(\beta) + \sin(\beta)\cdot\cos(\alpha)$$

$$\sin\left(x - \tfrac{3}{2}\pi\right) = \underbrace{\sin(x)\cdot\underbrace{\cos\left(-\tfrac{3}{2}\pi\right)}_{0}}_{0} + \underbrace{\sin\left(-\tfrac{3}{2}\pi\right)}_{1}\cdot\cos(x)$$

$$= \cos(x)$$

$$f(x) = 3 + 2 \cdot \sin\left(\tfrac{1}{4}x + \tfrac{7}{2}\pi\right)$$

$$\tfrac{7}{2}\pi \to 3{,}5\pi$$

$$\underbrace{\sin(\tfrac{1}{4}x) \cdot \cos(3{,}5\pi)}_{0} + \underbrace{\cos(\tfrac{1}{4}x) \cdot \sin(3{,}5\pi)}_{-\cos(\frac{1}{4}x)}$$

$$f(x) = 3 - 2 \cdot \cos(\tfrac{1}{4}x)$$

$$W: \quad 3 - 2 \cdot [-1; 1] = 3 - [-2; 2] = y \in [1; 5]$$

Periode: $P_{neu} = \frac{2\pi}{1/4} = 8\pi \rightarrow$ ÄFF

$$f(x) = f(\underline{x + 8\pi})$$

$$= 3 - 2 \cdot \cos\left(1/4 \cdot (x + 8\pi)\right)$$

$$3 - 2 \cdot \underbrace{\cos(1/4\, x + 2\pi)}$$

$$\cos(1/4\, x) \cdot \cos(2\pi) = \cos(1/4\, x)$$

$$-$$

$$\left.\sin(1/4\, x) \cdot \sin(2\pi)\right\} 0$$

$$= 3 - 2 \cdot \cos(1/4\, x)$$

Symmetrie : $f(x) = f(-x)$

$3 - 2 \cdot \cos(\tfrac{1}{4} x) = 3 - 2 \cdot \cos(-\tfrac{1}{4} x) \quad | -3 \quad | \cdot (-\tfrac{1}{2})$

$\cos(\tfrac{1}{4} x) = \cos(-\tfrac{1}{4} x)$

Ja, da $\cos(x) = \cos(-x)$ gilt