

$$\begin{aligned}
 1) \quad & \sqrt{x^3 \sqrt[4]{x^6} \sqrt[3]{x^7}} = (x^3 (x^6)^{1/4} ((x^7)^{1/3})^{1/4})^{1/2} \\
 & (x^3 \cdot x^{6/4} \cdot x^{7/12})^{1/2} = (x^{3 + 3/2 + 7/6})^{1/2} \\
 & (x^{\frac{18+9+7}{6}})^{1/2} = (x^{29/6})^{1/2} = x^{29/12} = \sqrt[12]{x^{29}}
 \end{aligned}$$

$$\begin{aligned}
 2) \quad & \frac{(2^3 m^2 v^{-2} w)^4}{(3^4 r^{-3} s^{-2} t^3)^2} \cdot \frac{(3^4 r^{-3} s^4 t^3)^2}{(2^4 m^3 v^{-4} w^{-2})^3} \\
 & \frac{2^{12} m^8 v^{-8} w^4 \cdot 3^8 r^{-6} s^8 t^6}{3^8 r^{-6} s^{-4} t^6 \cdot 2^{12} m^9 v^{-12} w^{-6}} \\
 & \frac{m^8 w^4 s^8 t^6 r^6 s^4 v^{12} w^6}{v^8 r^6 t^6 m^9} = \frac{w^{10} s^{12} v^4}{m}
 \end{aligned}$$

$$3) \frac{k\sqrt[k]{a^{4k}}}{(k\sqrt[k]{a})^{3k+4}} \cdot \left(\frac{k\sqrt[k]{a}}{(k\sqrt[k]{a^k})^{k+3}} \right)^{-2} = \frac{a^{\frac{2-k}{k}}}{a^{\frac{3k+4}{k}}} \cdot \frac{a^{-\frac{2}{k}}}{a^{\frac{-4k-12}{k}}}$$

$$a^{\frac{2-k - (3k+4) + (-2) - (-4k-12)}{k}} = a^{\frac{8}{k}} = \sqrt[k]{a^8}$$

$$4) \left(\frac{y^{-2} x^5 z^{15}}{x^{-3} y^4 z^7} \right)^{1/2} = \left(\frac{x^8 z^8}{y^6} \right)^{1/2} = x^4 y^{-3} z^4$$

$$5) \frac{(5a^5b^{-3}c^2)^3}{(2^{-3}x^2)^{-2}} \cdot \frac{(5^2xy^{-3})^{-2}}{(2^{-2}a^{-2}c^3)^2}$$

$$\frac{5^3 a^3 b^{-9} c^6}{2^6 x^{-4}} \cdot \frac{5^{-4} x^{-2} y^6}{2^{-4} a^{-4} c^6}$$

$$\frac{5^3 2^4}{5^9 2^6} \cdot \frac{a^3 c^6 y^6 x^4 a^4}{5^9 x^2 c^6} = \frac{1}{20} \cdot \frac{a^7 y^6 x^2}{5^9}$$

$$6) \left[\frac{2x \sqrt[3]{h^{3x-2}}}{2x \sqrt[3]{h^{4x-4}}} \cdot \left(2x \sqrt[3]{h} \right)^{5x-2} \right]^3$$

$$\left(\frac{h^{\frac{3x-2}{2x}}}{h^{\frac{4x-4}{2x}}} \cdot h^{\frac{5x-2}{2x}} \right)^3$$

$$h^{\frac{3x-2-(4x-4)+5x-2}{2x}} \cdot 3 = h^{\frac{12x}{2x}} = h^6$$

Symmetrie

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

↙

↘

$\cdot (-1)$

Achsensym.

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

↙

↘

Punktsym.

$\{ \}$

$$\sqrt[3]{\frac{16}{x^2}} = 0,25$$

$$\frac{2^{4/3}}{x^{2/3}} = 2^{-2}$$

$$\frac{2^{4/3}}{2^{-2}} = 2^{4/3} \cdot 2^2 = 2^{10/3} = x^{2/3}$$

$$| : (2^{-2}) \cdot x^{2/3}$$

$$|\uparrow^{3/2}$$

$$x = 2^5 = 32$$

$$f(x) = \frac{3x}{5-x^2}$$

$$f(-x) = \frac{3 \cdot (-x)}{5 - (-x)^2}$$

$$(-1) = \frac{-3x}{5-x^2} \neq f(x)$$

$$-f(-x) = -\left[\frac{-3x}{5-x^2}\right]$$

$$= \frac{3x}{5-x^2} = f(x)$$

\Rightarrow Punktsymmetrie