2) a) $\frac{2}{5} - \frac{5}{2y} + \frac{4}{y} - 2 + \frac{6}{10} - \frac{\overset{3}{\cancel{6}}}{\underset{2}{\cancel{4}y}}$

$$\frac{4y - \overline{25} + \overline{40} - 20y + 6y - \overline{15}}{10y} = \frac{-10y}{10y} = -1$$

b) $$\frac{\frac{4x^2 + 4xy + y^2}{4xy}}{\frac{12x^2 - 3y^2}{2xy}} = \frac{(\overline{2x} + y)^2}{4xy} \cdot \frac{\overline{2xy}}{3 \cdot (2x+y)(2x-y)}$$

$12x^2 - 3y^2 = 3 \cdot (4x^2 - y^2)$ 2

$$= \frac{2x+y}{6 \cdot (2x-y)}$$

3) a)

$2 = \sqrt{3x-8} + x \quad | -x$

$\mathbb{D} = \mathbb{R}^{\geq 8/3} \to 2\frac{2}{3}$

Wurzel: $x \geq 8/3$ Linear: $\mathbb{R}$

$= x \in [8/3; \infty[$

Isolieren

$2 - x = \sqrt{3x-8} \quad | \uparrow^2$

Nullform

$(2-x)^2 = 3x-8$

$4 - 4x + x^2 = 3x - 8 \quad | -3x+8$

$x^2 - 7x + 12 = 0$

$(x-3)(x-4) = 0 \qquad x_1 = 3 \lor x_2 = 4$

$\mathbb{L} = \{4; 3\}$

1) $\sqrt{x^3 \sqrt[4]{x^6 \sqrt[3]{x^7}}} = (x^3)^{1/2} \left(\left(x^6\right)^{1/4}\right)^{1/2} \left(\left(\left(x^7\right)^{1/3}\right)^{1/4}\right)^{1/2}$

$= x^{3/2} \cdot x^{3/4} \cdot x^{7/12}$

$= x^{\frac{18+9+7}{12}} = x^{28/12} = x^{7/3} = \sqrt[3]{x^7}$

3) $\dfrac{a^{\frac{2-k}{k}}}{a^{\frac{3k+4}{k}}} \cdot \dfrac{a^{-\frac{2}{k}}}{a^{\frac{-12-4k}{k}}} = a^{\frac{2-k-(3k+4)-2-(-12-4k)}{k}}$

$+4k$

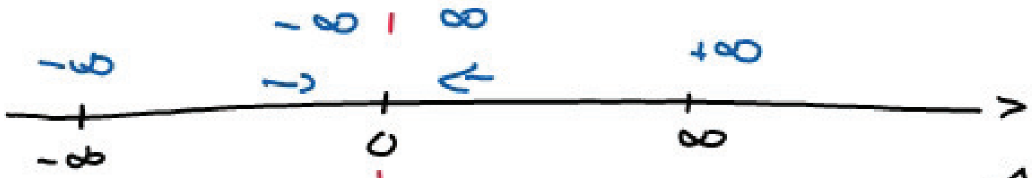
$= a^{8/k} = \sqrt[k]{a^8}$

2)
$$\frac{2^{12}\, u^{8}\, v^{-8}\, w^{4}\; 3^{+8}\, r^{-6}\, s^{+8}\, t^{+6}}{3^{8}\, r^{-6}\, s^{-4}\, t^{6}\; 2^{+12}\, u^{+9}\, v^{-12}\, w^{-6}}$$

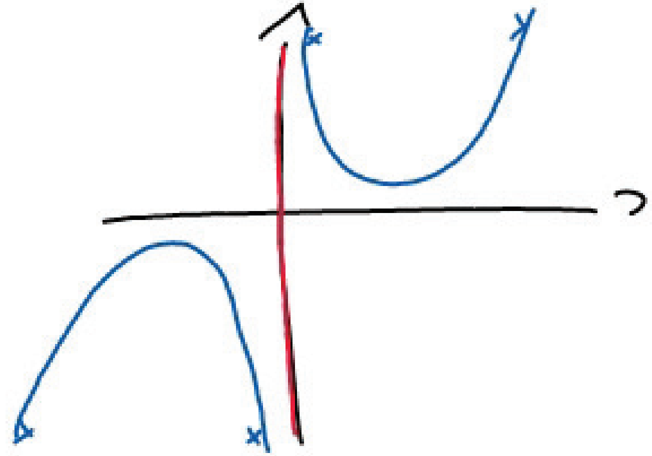
$$\frac{2^{12}\, 3^{8}\; u^{8}\, w^{4}\, s^{8}\, t^{6}\, r^{6}\, s^{4}\, v^{12}\, w^{6}}{3^{8}\, 2^{12}\; v^{8}\, r^{6}\; t^{6}\; u^{9}}$$

$$\frac{w^{10}\, s^{12}\, v^{4}}{u}$$

5) $g(x) = x^3 - 5x + \frac{1}{2x}$, $\mathbb{R} \setminus \{0\}$



$$\lim_{x \to -\infty} \underbrace{\left(x^3 - 5x + \frac{1}{2x}\right)}_{x^3 \cdot \left(1 - \frac{5}{x^2} + \frac{1}{2x^4}\right)}$$



$$g'(x) = 3x^2 - 5 - \frac{1}{2x^2} = 0$$

$$= \frac{6x^4 - 10x^2 - 1 = 0}{2x^2}$$

$x^2 = z$

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

Symmetrieverhalten

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

$-x$ einsetzen

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

J

N

Achsensym.

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

$\cdot(-1)$

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

J

N

Punktsym.

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