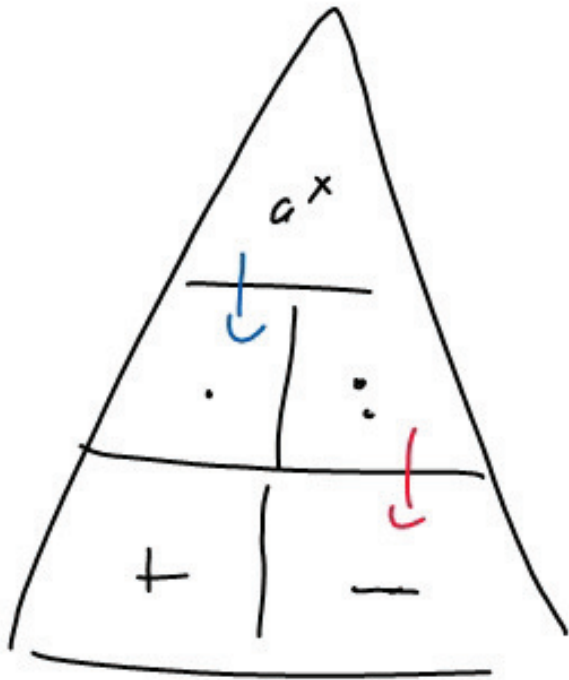


$$x^a \quad ; \quad a \in \mathbb{Q} \quad \mapsto \quad \frac{a}{b}$$



$$(x^3)^4 = x^{3 \cdot 4} = x^{12}$$

$$x^4 / x^2 = x^{4-2} = ?$$

$$x^{-4} = \frac{1}{x^4}$$

$$x^{1/2} = \sqrt[2]{x}$$

$$1) \sqrt{x^3} \sqrt[4]{x^6} \sqrt[3]{x^2} = x^{3/2} \cdot x^{6/8} \cdot x^{2/24} \cdot x^{1/12}$$

$$= x^{\frac{18+9+1}{12}} = x^{28/12} = x^{7/3} = x \sqrt[3]{x^4}$$

$$2) \frac{(2^3 u^7 v^{-2} w)^4}{(3^4 r^{-3} s^{-2} t^3)^2} \cdot \frac{(3^4 \cdot v^{-3} s^4 t^3)^2}{(2^4 u^3 v^{-4} w^{-2})^3}$$

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

$$\frac{u^8 w^4 s^8 t^6 r^6 s^4 v^{12} w^6}{v^8 r^6 t^6 u^9} = \frac{w^{10} s^{12} v^4}{u}$$

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

$$\frac{a^{\frac{2-k}{k}}}{a^{\frac{3k+4}{k}}} \cdot \frac{a^{-2/k}}{a^{\frac{-4k-12}{k}}}$$

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

$$1) \left(\sqrt[4]{2x^3} - \sqrt{x^{1/2}} \right)^4 - \left(\frac{1}{2x} + x^3 \right)^2$$

$$1(2x^3)^4 + 4(2x^3)^3(-x^{1/2})^1 + 6(2x^3)^2(-x^{1/2})^2 + 4(2x^3)^1(-x^{1/2})^3 + 1(-x^{1/2})^4$$

$$16x^8 - 32x^6 \cdot x^{1/2} + 24x^4x - 8x^2 \cdot x^{3/2} + x^2$$

$$16x^8 - 32x^{13/2} + 24x^5 - 8x^{7/2} + \underline{x^2} - \left(\frac{1}{4x^2} + \underline{x^1} + x^6 \right)$$

$$\left(\frac{1}{2}x^{-1} + x^3 \right)^2 = \frac{1}{4}x^{-2} + \underbrace{x^{-1} \cdot x^3}_{x^2} + x^6$$

$$16x^8 - x^6 - 32x^{13/2} + 24x^5 - 8x^{7/2} - \frac{1}{4x^2}$$

$$2) \quad \sqrt[5]{12} \cdot \sqrt[3]{6} = \sqrt[5]{12} \cdot \sqrt[3]{2 \cdot 3} = \sqrt[5]{12} \cdot \sqrt[3]{2} \cdot \sqrt[3]{3} = \sqrt[5]{12} \cdot \sqrt[3]{6}$$

$$\hookrightarrow \sqrt[5]{12} \cdot \sqrt[3]{6} = \sqrt[5]{12} \cdot \sqrt[3]{6}$$

$$\sqrt[5]{\frac{5+72-8-24}{12}} = \sqrt[5]{\frac{45}{12}} = \sqrt[5]{\frac{15}{4}} = \sqrt[4]{\sqrt[5]{15}}$$

$$= \sqrt[5]{3^{3/4}} = \sqrt[5]{3^3} \cdot \sqrt[4]{3}$$

$$3) \left[x^{1/2} \cdot (x^4 - x^{-2/3}) - x^{-2} \cdot (x^6 + x^{6/5}) \right] \cdot x^2$$

$$(x^{9/2} - x^{-1/6} - x^4 - x^{-4/5}) \cdot x^2$$

$$x^{13/2} - x^{11/6} - x^6 - x^{6/5}$$

$$\begin{aligned} &: \frac{1}{x^2} \\ &= x^{-2} \\ &= x^{-(-2)} \end{aligned}$$

$$4) \frac{x^{-2} x^6 x^{-8/5} x^{-1/3}}{x^3 x^{-1/4} x^{-9/2}}$$

$$x^{\underline{-2+6} - \frac{8}{5} - \frac{1}{3} - \underline{3} + \frac{1}{4} + \frac{9}{2}}$$

$$= x^{\frac{-96-70+15+270}{60}} \cdot x$$

$$x^1 \cdot x^{169/60} = x^{229/60}$$