1) $$\frac{\frac{2}{7}-\frac{3}{5}}{\frac{-\frac{1}{3}-\frac{1}{6}}{2}} = \frac{\frac{10-21}{35}}{\frac{\frac{-2-1}{6}}{2}} = \frac{-\frac{11}{35}}{\frac{-\frac{1}{2}}{\frac{2}{1}}}$$

$$= \frac{-\frac{11}{35}}{-\frac{1}{2}\cdot\frac{1}{2}} = +\frac{11}{35}\cdot\frac{4}{1} = \boxed{\frac{44}{35}}$$

$$\frac{20}{60} = \boxed{\frac{1}{3}}$$

2) $$\frac{\sqrt{x+y}}{\frac{\sqrt{x-y}}{\sqrt{x^2-y^2}}} - x - y = \frac{\sqrt{x+y}}{\frac{\cancel{\sqrt{x-y}}}{\sqrt{x+y}\,\cancel{\sqrt{x-y}}}} - x - y$$

$$A^2 - B^2 = (A+B)(A-B)$$

$$\sqrt[n]{a\cdot b} = \sqrt[n]{a}\cdot\sqrt[n]{b}$$

$$= \frac{\sqrt{x+y}}{\frac{1}{\sqrt{x+y}}} - x - y = \left(\sqrt{x+y}\right)^2 - x - y$$

$$= x+y-x-y$$

$$= \boxed{0}$$

$x^2-y^2 \neq 0$

$x-y \neq 0$

$(x+y)\cdot(x-y) \neq 0$

$x \neq \pm y$ $\quad$ $x+y>0$

$x-y>0$

3) $\sqrt[5]{\left(\frac{c^{\frac{1}{2}}\cdot c^{-\frac{1}{3}}}{c^{-5/6}}\right)^{-3}} = \left(\frac{c^{\frac{1}{2}-\frac{1}{3}}}{c^{-5/6}}\right)^{-\frac{3}{5}} =$

$a^r\cdot a^s = a^{r+s}$ $\quad$ $\frac{a^r}{a^s} = a^{r-s}$ $\quad$ $(a^r)^s = a^{r\cdot s}$

$\sqrt[r]{a} = a^{\frac{1}{r}}$

$= \left(\frac{c^{1/6}}{c^{-5/6}}\right)^{-\frac{3}{5}} = \left(c^{1/6+\frac{5}{6}}\right)^{-\frac{3}{5}} = c^{-3/5}$ $\quad\Big|\quad$ $c\neq 0$, $c\geq 0$ $\Downarrow$ $c>0$

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5) $\left[\left(\frac{x}{y}\right)^2 - \frac{x}{y^2}\right] : \left(\frac{x-1}{y}\right)^2 =$ $\quad$ $\left(\frac{a}{b}\right)^r = \frac{a^r}{b^r}$

$= \left[\frac{x^2}{\cancel{y^2}} - \frac{x}{\cancel{y^2}}\right]\cdot\frac{\cancel{y^2}\ 1}{(x-1)^2} =$

$= \underbrace{(x^2-x)}_{1}\cdot\frac{1}{(x-1)^2} = \frac{x\cdot\cancel{(x-1)}}{(x-1)^{\cancel{2}}} = \frac{x}{x-1}$

$y\neq 0 \quad x-1\neq 0 \longrightarrow y\neq 0 \quad x\neq 1$ ✓

b) $$\frac{\left(\sqrt[4]{u}+\sqrt[4]{v}\right)^2+\left(\sqrt[4]{u}-\sqrt[4]{v}\right)^2}{u-v} : \frac{2}{\sqrt{u}-\sqrt{v}}$$

$$(A+B)^2 = A^2 + 2AB + B^2$$
$$(A-B)^2 = A^2 - 2AB + B^2$$

$A = \sqrt[4]{u}$

$A^2 = \sqrt{u}$

$$= \frac{2\sqrt{u}+2\sqrt{v}}{\underbrace{u-v}_{A^2-B^2}} \cdot \frac{\overbrace{\sqrt{u}-\sqrt{v}}^{A-B}}{2}$$

A^2-B^2

$u - v \neq 0$

$u \geq 0$

$v \geq 0$

$$= \frac{\cancel{2}\,\cancel{\left(\sqrt{u}+\sqrt{v}\right)}}{\cancel{\sqrt{u}+\sqrt{v}}} \cdot \frac{1}{\cancel{2}} = 1.$$

$p(x)$ $\qquad p(x_i) = 0$

$= a_1 (x - x_1) \cdot (x - x_2) \cdot \cdot$

$$\underbrace{\frac{x-1}{x^2-2x+1}} = \frac{\cancel{x-1}}{(x-1)^{\cancel{2}}} = \frac{1}{x-1}$$

$$ax^2 + bx + c = 0$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2a}$$

$$x^2 - 5x - 6 = 0 \qquad x_{1,2} = \frac{5 \pm \sqrt{25+24}}{2}$$

$$(x-6) \cdot (x+1) = 0 \qquad = \frac{5 \pm 7}{2} = \begin{cases} 6 \\ -1 \end{cases}$$

$$x^2 \underline{-5x} - \cancel{6} = \underbrace{\left(x - \frac{5}{2}\right)^2} - 6 - \frac{25}{4}$$

$$-B^2$$

$$(A+B)^2 = A^2 + 2A \cdot B + \underbrace{B^2}$$

x $\qquad A = x$

$2B = -5$

$B = -\frac{5}{2}$

$$= x^2 - 5 \cdot x + \cancel{\frac{25}{4}} - 6 - \cancel{\frac{25}{4}}$$

$$x^2-5x-6 = \left(x-\frac{5}{2}\right)^2 - 6 - \frac{25}{4}$$

$$= \left(x-\frac{5}{2}\right)^2 - \frac{49}{4}$$

$$A^2 - B^2 \qquad B = \frac{7}{2}$$

$$\overset{A+B}{=\left(x-\frac{5}{2}+\frac{7}{2}\right)} \cdot \overset{A-B}{\left(x-\frac{5}{2}-\frac{7}{2}\right)}$$

$$= (x+1)(x-6)$$

$$\sqrt{\underbrace{b^2-4ac}_{D}} \qquad D<0 \longrightarrow \sqrt{D} \notin \mathbb{R}$$

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

$$A^2 - B^2$$

$$D = 1-4 = -3$$

$$B^2 = -\frac{3}{4}$$

$$(x-x_1)(x-x_2) \quad x_{1,2} \in \mathbb{R}$$

Trojčlenka

0,7 GB – 5 min

4,9 GB – ? min

700 MB $\downarrow$ GB

0,7 GB .... 5 min

4,9 GB x

přímá úměra

$$\frac{x}{5} = \frac{4,9}{0,7} \quad / \cdot 5$$

$$x = 7 \cdot 5 = 35 \text{ min}$$

Bazén

0,1 l/s .... 36 h

6 l/s x

$$\frac{x}{36} = \frac{0,1}{6}$$

$$\boxed{x = 0,6 \text{ h}}$$

$$(a-b)(a^n+a^{n-1}b+\dots+ab^{n-1}+b^n)=a^{n+1}-b^{n+1}$$

$n=3$

$$(a-b)(a^3+a^2b+ab^2+b^3)=a^4-b^4 \qquad \frac{1}{a-b}$$

$$a^4-b^4$$

17) $$\frac{\frac{a^3}{b^2}+\frac{a^2}{b}+a+b}{\frac{a^2}{b^2}-\frac{b^2}{a^2}}=\frac{(\quad\dots\quad)}{\frac{a^4-b^4}{a^2b^2}}$$

$$=\frac{a^2b^2\cdot\left(\frac{a^3}{b^2}+\frac{a^2}{b}+a+b\right)}{a^4-b^4}=\frac{a^2(a^3+a^2b+ab^2+b^3)}{a^4-b^4}$$

$$=\frac{a^2}{a-b}$$

$$\boxed{a,b\neq 0}$$

$$\frac{a^4-b^4}{a^2b^2}\neq 0$$

$$a^4-b^4\neq 0$$

$$(a^2+b^2)(a^2-b^2)\neq 0$$

$$a^2\neq\pm b^2$$

$$a^2\neq b^2$$

$$\boxed{a=\pm b}$$

$$\sqrt{4v^4\sqrt{v^{12}}} = \sqrt{4}\sqrt{v^4\sqrt{v^{12}}}$$

$$= 2\left(v^4\, v^{\frac{12}{2}}\right)^{\frac{1}{2}} = 2\left(v^{4+6}\right)^{\frac{1}{2}}$$

$$= 2\left(v^{10}\right)^{\frac{1}{2}}$$

$$= 2v^{\frac{10}{2}} = 2v^5$$

$$\boxed{v \geq 0}$$