

Преобразование рациональных выражений



$$a) x + 1 - \overset{2}{\frac{1}{x+2}} \cdot \overset{1}{\frac{x^2-4}{x}} = \frac{x^2+2}{x}$$

$$1) \frac{1}{x+2} \cdot \frac{(x-2)(x+2)}{x} = \frac{x-2}{x}$$

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

$$b) \left(\frac{b}{a^2 - ab} + \frac{a}{ab - b^2} \right) \cdot \frac{a^2 b + ab^2}{a^2 + b^2} + 1 = \frac{2a}{a - b}$$

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

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

$$3) \frac{a + b}{a - b} + \frac{1}{1} = \frac{a + b + a - b}{a - b} = \frac{2a}{a - b}$$

$$e) \frac{\frac{x^{\textcolor{red}{1}}}{y} - \frac{y}{x^{\textcolor{red}{2}}}}{\frac{x}{y} + \frac{y^{\textcolor{red}{2}}}{x} - 2^{\textcolor{red}{3}}} = \frac{x+y}{x-y}$$

$$1) \frac{x}{y} - \frac{y}{x} = \frac{x^2 - y^2}{yx}$$

$$2) \frac{x}{y} + \frac{y}{x} - \frac{2}{1} = \frac{x^2 + y^2 - 2xy}{xy} = \frac{(x-y)^2}{yx}$$

$$3) \frac{(x-y)(x+y)}{yx} : \frac{(x-y)^2}{yx} = \frac{(x-y)(x+y)}{yx} \cdot \frac{yx}{(x-y)^2} = \frac{x+y}{x-y}$$

$$e) \frac{1}{1 - \frac{1}{1 - \frac{1}{x+1}}} = -x$$

$$1) \frac{1}{1} - \frac{1}{x+1} = \frac{x+1-1}{x+1} = \frac{x}{x+1}$$

$$2) \frac{1}{1} : \frac{x}{x+1} = \frac{1}{1} \cdot \frac{x+1}{x} = \frac{x+1}{x}$$

$$3) \frac{1}{1} - \frac{x+1}{x} = \frac{x - x - 1}{x} = -\frac{1}{x}$$

$$4) \frac{1}{1} : \left(-\frac{1}{x} \right) = \frac{1}{1} \cdot \left(-\frac{x}{1} \right) = -x$$