

$$1. \left(\frac{2y^2}{1+y} - y + 1 \right) : \frac{y^2 + y^4}{4yz^2 + 4z^2} \quad \text{c.e.: } y + 1 \neq 0; y \neq 0; z \neq 0$$

$$= \frac{2y^2 - y - y^2 + 1 + y}{1+y} : \frac{y^2(1+y^2)}{4z^2(y+1)} = \frac{y^2 + 1}{1+y} \cdot \frac{4z^2(y+1)}{y^2(1+y^2)} = \frac{4z^2}{y^2}$$

$$2. \frac{2x^3}{x+y} : \frac{4xy}{x^2 + 2xy + y^2} : \frac{x^2 - y^2}{xy - y^2}$$

$$= \frac{2x^3}{x+y} : \frac{4xy}{(x+y)^2} : \frac{(x-y)(x+y)}{y(x-y)} = \quad \text{c.e.: } x \neq 0; y \neq 0$$

$$x - y \neq 0; \quad x + y \neq 0$$

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

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

$$\text{c.e.: } x \neq 0; \quad x + 1 \neq 0$$

$$x - 1 \neq 0; \quad x + 2 \neq 0; \quad x - 2 \neq 0$$

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

$$4. \frac{2a}{b-a} + \frac{5a^2 - ab}{a^2 - b^2} - \frac{3a}{a+b}$$

$$\text{c.e.: } a + b \neq 0$$

$$a - b \neq 0$$

$$= -\frac{2a}{a-b} + \frac{5a^2 - ab}{(a-b)(a+b)} - \frac{3a}{a+b} =$$

$$= \frac{-2a(a+b) + 5a^2 - ab - 3a(a-b)}{(a-b)(a+b)} = \frac{-2a^2 - 2ab + 5a^2 - ab - 3a^2 + 3ab}{(a-b)(a+b)} = 0$$

$$5. \left(x - 2 + \frac{6}{x+3} \right) \cdot \frac{x^2 + 6x + 9}{2x + 6} \cdot \frac{1}{x + x^2}$$

c.e.: $x \neq 0$; $x + 3 \neq 0$

$$= \frac{x^2 + x - 6 + 6}{x + 3} \cdot \frac{(x + 3)^2}{2(x + 3)} \cdot \frac{1}{x(1 + x)} =$$

$$= \frac{x(x + 1)}{x + 3} \cdot \frac{(x + 3)^2}{2(x + 3)} \cdot \frac{1}{x(1 + x)} = \frac{1}{2}$$

$$6. \frac{2y + 2}{y^2 - 4} + \frac{3y}{y^2 - 4y + 4} - \frac{4y^2 + 4y}{y^3 - 2y^2 - 4y + 8}$$

$$= \frac{2y + 2}{(y - 2)(y + 2)} + \frac{3y}{(y - 2)^2} - \frac{4y^2 + 4y}{y^2(y - 2) - 4(y - 2)} =$$

$$= \frac{2y + 2}{(y - 2)(y + 2)} + \frac{3y}{(y - 2)^2} - \frac{4y^2 + 4y}{(y - 2)(y^2 - 4)} =$$

$$= \frac{2y + 2}{(y - 2)(y + 2)} + \frac{3y}{(y - 2)^2} - \frac{4y^2 + 4y}{(y - 2)^2(y + 2)} =$$

c.e.: $y + 2 \neq 0$

$y - 2 \neq 0$

$$= \frac{(2y + 2)(y - 2) + 3y(y + 2) - 4y^2 - 4y}{(y - 2)^2(y + 2)} =$$

$$= \frac{2y^2 - 4y + 2y - 4 + 3y^2 + 6y - 4y^2 - 4y}{(y - 2)^2(y + 2)} = \frac{y^2 - 4}{(y - 2)^2(y + 2)} =$$

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