

Fasse zusammen, gib jeweils die Definitionsmenge an!

$$a) \quad \frac{x+2}{4} + \frac{x-2}{4} = \frac{x+2+x-2}{4} = \frac{2x}{4} = \frac{x}{2} \quad D = \mathbb{R}$$

$$b) \quad \frac{x+2}{4} + \frac{x}{2} - \frac{x+1}{3} = \frac{x+2}{4} + \frac{2x}{4} - \frac{x+1}{3} = \frac{3x+6+6x-4x-4}{12} = \frac{5x+2}{12} \quad D = \mathbb{R}$$

$$c) \quad \frac{u+v}{2} + \frac{u}{3} - \frac{v}{6} = \frac{3(u+v)}{6} + \frac{2u}{6} - \frac{v}{6} = \frac{3u+3v+2u-v}{6} = \frac{5u-2v}{6} \quad D = \mathbb{R}$$

$$d) \quad \frac{20}{x^2-2} - \frac{10}{x^2-2} = \frac{20-10}{x^2-2} = \frac{10}{x^2-2} \quad D = \mathbb{R} \setminus \{\pm\sqrt{2}\}$$

$$e) \quad \frac{1}{u+v} + \frac{2}{u-v} = \frac{u-v}{(u+v) \cdot (u-v)} + \frac{2(u+v)}{(u+v) \cdot (u-v)} = \frac{u-v+2u+2v}{u^2-v^2} = \frac{3u+v}{u^2-v^2} \quad u \neq v \text{ und } u \neq -v$$

$$f) \quad \frac{2}{3n} + \frac{10}{n+1} - \frac{3}{n} = \frac{2}{3n} + \frac{10}{n+1} - \frac{9}{3n} = \frac{2 \cdot (n+1) + 10 \cdot 3n - 9 \cdot (n+1)}{3n \cdot (n+1)} = \frac{2n+2+30n-9n-9}{3n \cdot (n+1)} = \frac{23n-7}{3n \cdot (n+1)}$$

$$D = \mathbb{R} \setminus \{0; -1\}$$

$$g) \quad \frac{1}{a+3} + \frac{2}{a^2+6a+9} = \frac{1}{a+3} + \frac{2}{(a+3)^2} = \frac{(a+3)+2}{(a+3)^2} = \frac{a+5}{(a+3)^2} \quad a \neq -3$$

$$h) \quad \frac{4}{4x^2-4} + \frac{x-1}{x+1} = \frac{1}{x^2-1} + \frac{x-1}{x+1} = \frac{1}{(x+1) \cdot (x-1)} + \frac{(x-1) \cdot (x-1)}{(x+1) \cdot (x-1)} = \frac{1+x^2-2x+1}{(x+1) \cdot (x-1)} = \frac{x^2-2x+2}{x^2-1}$$

$$x \neq -1; x \neq 1$$

$$i) \quad 3a+3 + \frac{2}{2a-2} = \frac{3a(a-1)+3(a-1)+1}{(a-1)} = \frac{3a^2-3a+3a-3+1}{(a-1)} = \frac{3a^2-2}{a-1} \quad a \neq 1$$

$$j) \quad \frac{c}{c-2} + \frac{1}{c+2} = \frac{c(c+2)+(c-2)}{(c-2) \cdot (c+2)} = \frac{c^2+2c+c-2}{c^2-4} = \frac{c^2+3c-2}{c^2-4} \quad c \neq 2; c \neq -2$$