1) $$\frac{ax+ay}{a+b}+\frac{bx+by}{a+b}=\frac{ax+ay+bx+by}{a+b}=\frac{a(x+y)+b(x+y)}{a+b}$$

$$=\frac{(x+y)\cdot(a+b)}{(a+b)}=\underline{\underline{x+y}}$$

2) $$\frac{8xy}{4x^2-4y^2}+\frac{2x-2y}{2x+2y}=\frac{8xy}{4(x^2-y^2)}+\frac{2(x-y)}{2(x+y)}$$

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

$$\boxed{\frac{x^2+y^2}{(x+y)(x-y)}}$$

3.)

$$\frac{(3x-y)\cdot 6}{(4x-2y)^6} - \frac{(2x+3y)\cdot 9}{(6x-3y)^4} + \frac{(5x+2y)\cdot 3}{(8x-4y)^3} - \frac{1\cdot 12(2x-y)}{1\,|\,12(2x-y)}$$

HN

$4x-2y = 2(2x-y)$ Erw. $\cdot 6$

$6x-3y = 3(2x-y)\cdot 4$

$8x-4y = 4(2x-y)\cdot 3$

$12\cdot(2x-y)$

$$\frac{18x-6y-(8x+12y)+15x+6y\ominus 12(2x\ominus y)}{12(2x-y)}$$

$$\frac{18x-6y-8x-12y+15x+6y-24x+12y}{12(2x-y)} = \frac{X}{12(2\cdot x-y)} = \frac{X}{24x-12y}$$

4.)

$$\frac{\frac{1\cdot y}{x\cdot y}+\frac{1\cdot x}{y\cdot x}}{\frac{(x+y)\cdot x}{y\cdot x}+\frac{(x+y)\cdot y}{x\cdot y}}=\frac{\left(\frac{x+y}{x\cdot y}\right)}{\left(\frac{(x+y)\cdot x+(x+y)\cdot y}{x\cdot y}\right)}=\frac{x+y}{x\cdot y}\cdot\frac{x\cdot y}{(x+y)\cdot x+(x+y)\cdot y}$$

Kehrwert

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