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

$$\frac{9x^2}{3xy-y^2}-\frac{y}{3x-y}=\frac{9x^2}{y(3x-y)}-\frac{y}{3x-y}=\frac{9x^2}{y(3x-y)}-\frac{y^2}{(3x-y)y}=\frac{9x^2-y^2}{y(3x-y)}=\frac{(3x+y)(3x-y)}{y(3x-y)}=\frac{3x+y}{y}$$

$$\frac{x}{x-4}-\frac{x+2}{x-2}=\frac{x(x-2)}{(x-4)(x-2)}-\frac{(x+2)(x-4)}{(x-2)(x-4)}=\frac{x(x-2)-(x+2)(x-4)}{(x-4)(x-2)}=\frac{\left(x^2-2x\right)-\left(x^2-4x+2x-8\right)}{(x-4)(x-2)}=$$

$$=\frac{\left(x^2-2x\right)-\left(x^2-2x-8\right)}{(x-4)(x-2)}=\frac{x^2-2x-x^2+2x+8}{(x-4)(x-2)}=\frac{8}{(x-4)(x-2)}$$

$$6y+\frac{12y}{6y-1}-1=(6y-1)+\frac{12y}{6y-1}=\frac{(6y-1)^2}{6y-1}+\frac{12y}{6y-1}=\frac{(6y-1)^2+12y}{6y-1}=\frac{\left(36y^2-12y+1\right)+12y}{6y-1}=$$

$$=\frac{36y^2-12y+1+12y}{6y-1}=\frac{36y^2+1}{6y-1}$$

$$\frac{3}{x+3}+\frac{3}{x^2-3x}+\frac{2x}{9-x^2}=\frac{3}{x+3}+\frac{3}{x^2-3x}+\frac{2x}{-x^2+9}=\frac{3}{x+3}+\frac{3}{x^2-3x}-\frac{2x}{x^2-9}=\frac{3}{x+3}+\frac{3}{x(x-3)}-\frac{2x}{(x-3)(x+3)}=$$

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

$$=\frac{(3x)(x-3)+3(x+3)-2x^2}{(x+3)x(x-3)}=\frac{\left(3x^2-9x\right)+(3x+9)-2x^2}{(x+3)x(x-3)}=\frac{3x^2-9x+3x+9-2x^2}{(x+3)x(x-3)}=$$

$$=\frac{x^2-6x+9}{(x+3)x(x-3)}=\frac{(x-3)(x-3)}{(x+3)x(x-3)}=\frac{x-3}{(x+3)x}$$