

№1(а)

1 действие

$$\frac{2a}{b^2} \cdot \frac{1}{2a} = \frac{2^2 a^2}{b^2 2a} = \frac{b^2}{2ab^2} = \frac{2^2 a^2 - b^2}{2b^2 a} = \frac{4a^2 - b^2}{2b^2 a}$$

2 действие

$$\frac{1}{b} + \frac{1}{2a} = \frac{2a}{b2a} + \frac{b}{2ab} = \frac{2a+b}{2ba}$$

3 действие

$$\begin{aligned} \frac{4a^2 - b^2}{2b^2 a} \cdot \frac{2a+b}{2ba} &= \frac{4a^2 - b^2}{2b^2 a} \cdot \frac{2ba}{2a+b} = \frac{(4a^2 - b^2)2ba}{2b^2 a(2a+b)} = \frac{(4a^2 - b^2)b}{b^2(2a+b)} = \frac{4a^2 - b^2}{b(2a+b)} = \\ &= \frac{(2a-b)(2a+b)}{b(2a+b)} = \frac{2a-b}{b} \end{aligned}$$

№1(б)

1 действие

$$\frac{2m}{2m-1} + 1 = 1 + \frac{2m}{2m-1} = \frac{2m-1}{2m-1} + \frac{2m}{2m-1} = \frac{(2m-1)+2m}{2m-1} = \frac{2m-1+2m}{2m-1} = \frac{4m-1}{2m-1}$$

2 действие

$$\frac{4m-1}{2m-1} \cdot \frac{6m-3}{4m^2-m} = \frac{(4m-1)(6m-3)}{(2m-1)(4m^2-m)} = \frac{(4m-1)3}{4m^2-m} = \frac{(4m-1)3}{m(4m-1)} = \frac{3}{m}$$

№1(в)

1 действие

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

2 действие

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

№2(а)

1 действие

$$\frac{a^2-x^2}{b^2-16} \cdot \frac{b+4}{a-x} = \frac{(a^2-x^2)(b+4)}{(b^2-16)(a-x)} = \frac{(a+x)(a-x)(b+4)}{(b-4)(b+4)(a-x)} = \frac{a+x}{b-4}$$

2 действие

$$\frac{a+x}{b-4} + \frac{x}{4-b} = \frac{a+x}{b-4} + \frac{x}{-b+4} = \frac{a+x}{b-4} - \frac{x}{b-4} = \frac{(a+x)-x}{b-4} = \frac{a+x-x}{b-4} = \frac{a}{b-4}$$

№2(б)

1 действие

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

2 действие

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

№2(в)

1 действие

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

2 действие

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

3 действие

$$\begin{aligned} \frac{a-2}{a^2-a+1} \cdot \left(-\frac{a-2}{(a+1)(a^2-a+1)} \right) &= -\frac{a-2}{a^2-a+1} \cdot \frac{a-2}{(a+1)(a^2-a+1)} = -\frac{a-2}{a^2-a+1} \cdot \frac{(a+1)(a^2-a+1)}{a-2} = \\ &= -\frac{(a-2)(a+1)(a^2-a+1)}{(a^2-a+1)(a-2)} = -a-1 \end{aligned}$$