

$$1. \frac{(3a+2)2 + 4}{a+b \cdot 2} \cdot \frac{1}{2(a+b)}$$

$$\frac{6a+4}{2(a+b)} + \frac{4}{2(a+b)}$$

$$\frac{6a+8}{2(a+b)} = \frac{\cancel{2}(3a+4)}{\cancel{2}(a+b)} + \boxed{\frac{3a+4}{a+b}}$$

$$2. \frac{3 \cdot 5}{4a \cdot 5} - \frac{2 \cdot 4}{5a \cdot 4} - \frac{1 \cdot 10}{2a \cdot 10}$$

$$\frac{15}{20a} - \frac{8}{20a} - \frac{10}{20a} = \boxed{\frac{-3}{20a}}$$

$$3. \frac{7}{y-8} \mp \frac{6}{-(y-8)}$$

$$\frac{7}{y-8} + \frac{6}{y-8} = \boxed{\frac{13}{y-8}}$$

$$4. \frac{x(x-3)}{(x+3)(x-3)} - \frac{6x}{(x+3)(x-3)}$$

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

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

$$5. \frac{3(a-3)}{(a-2)(a-3)} + \frac{2(a-2)}{(a-3)(a-2)}$$

$$\frac{3a-9+2a-4}{(a-2)(a-3)} = \boxed{\frac{5a-13}{(a-2)(a-3)}}$$

$$6. \quad \frac{\cancel{8}}{2(y-8)} + \frac{y}{-(y-8)}$$

$$\frac{4}{y-8} + \frac{y}{y-8} = \boxed{\frac{4+y}{y-8}}$$

$$7. \quad \frac{5 \cdot 2}{(x-7)(x+4) \cdot 2} + \frac{7(x+4)}{2(x-7)(x+4)}$$

$$\frac{10 + 7x + 28}{2(x-7)(x+4)} = \boxed{\frac{7x + 38}{2(x-7)(x+4)}}$$

$$8. \quad \frac{w+12}{4(w-4)} - \frac{(w+4) \cdot 2}{2(w-4) \cdot 2}$$

$$\frac{w+12 - 2w - 8}{4(w-4)} = \frac{-w+4}{4(w-4)} = \frac{\cancel{4-w}}{-4(\cancel{4-w})} = \boxed{\frac{-1}{4}}$$

$$9. \quad \frac{x(x+y)}{(x-y)(x+y)} - \frac{2x}{(x-y)(x+y)}$$

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

$$10. \quad \frac{3(x+2)}{(x+2)(x+1)(x+2)} - \frac{4(x+1)}{(x+2)(x+2)(x+1)}$$

$$\frac{3x+6-4x-4}{(x+2)^2(x+1)} = \boxed{\frac{-x+2}{(x+2)^2(x+1)}}$$

$$11. \frac{x(x+4)}{(x+1)(x+4)} - \frac{4(x+1)}{(x+4)(x+1)} + \frac{3}{(x+4)(x+1)}$$

$$\frac{x^2 + 4x - 4x - 4 + 3}{(x+4)(x+1)}$$

$$\frac{x^2 - 1}{(x+4)(x+1)} = \frac{\cancel{(x+1)}(x-1)}{(x+4)\cancel{(x+1)}} = \boxed{\frac{x-1}{x+4}}$$

$$12. \frac{(2x+1)(x-4)}{(x+5)(x-3)(x-4)} - \frac{x(x-3)}{(x+5)(x-4)(x-3)}$$

$$\frac{2x^2 - 7x - 4 - x^2 + 3x}{(x+5)(x-3)(x-4)}$$

$$\boxed{\frac{x^2 - 4x - 4}{(x+5)(x-3)(x-4)}}$$