

Name: Key

Date: \_\_\_\_\_

Unit: Rational Functions

CW: Add/Subtract w/ Unlike Denominators

**Directions:** Add or subtract each expression and simplify wherever necessary.

$$1) \frac{x+5}{8} + \frac{x-3}{12} \quad \frac{3(x+5) + 2(x-3)}{24}$$

$$\frac{3x+15+2x-6}{24} = \boxed{\frac{5x+9}{24}}$$

$$2) \frac{8}{9x^3} + \frac{5}{6x^2}$$

$$\frac{16 + 15x}{18x^3}$$

$$3) \frac{-2}{x-5} - \frac{3(x-5)}{x(x-5)} = \frac{-2x-3(x-5)}{x(x-5)}$$

$$\frac{-2x-3x+15}{x(x-5)}$$

$$\frac{-5x+15}{x(x-5)}$$

$$\boxed{\frac{-5(x-3)}{x(x-5)}}$$

$$4) \frac{x+1}{x-4} - \frac{x+1}{x^2-7x+12}$$

$$(x-3)(x-4)(x-3)$$

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

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

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

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

$$\boxed{\frac{x+1}{x-3}}$$

$$5) \frac{x(x+7)}{x^2+15x+56} - \frac{7}{x^2+13x+42}$$

$$(x+7)(x+9)(x+6) \quad (x+6)(x+7)(x+9)$$

$$\frac{x(x+7) - 7(x+9)}{(x+7)(x+9)(x+6)}$$

$$\frac{x^2+7x-7x-63}{(x+7)(x+9)(x+6)}$$

$$\frac{x^2-63}{(x+7)(x+9)(x+6)}$$

$$\boxed{\frac{x^2-63}{(x+7)(x+9)(x+6)}}$$

$$6) \frac{4-a^2}{a^2-9} - \frac{a-2}{3-a}$$

$$(a+3)(a-3)$$

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

$$\frac{4-a^2 - (a^2-3a+2a+6)}{(a+3)(a-3)}$$

$$\frac{4-a^2+a^2+3a-2a-6}{(a+3)(a-3)}$$

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

(3+x)

$$7) \frac{3+x}{3-x} + \frac{3-x}{3+x} \frac{(3-x)}{(3-x)}$$

$$\frac{(3+x)(3+x) + (3-x)(3-x)}{(3+x)(3-x)}$$

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

$$\boxed{\frac{2x^2 + 18}{(3+x)(3-x)}}$$

$$-(x^2-1)$$

(y) (y^2-1)

$$8) \frac{4y}{y^2-1} - \frac{2}{y} - \frac{2}{y+1} \frac{(y)(y-1)}{(y)(y-1)}$$

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

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

$$\frac{2+2y}{y(y+1)(y-1)}$$

$$\frac{2(1+y)}{y(y+1)(y-1)} = \boxed{\frac{2}{y(y-1)}}$$

$$9) \frac{(x+2)}{x+1} + \frac{x+6}{x^2-2x-35} \frac{(x-7)}{(x-7)}$$

$$(x+2)(x-7)(x+5) + (x+6)(x-7)$$

$$\frac{(x+2)(x+1) + (x+6)(x-7)}{(x+2)(x-7)(x+5)}$$

$$\frac{x^2+x+2x+2+x^2-7x+6x-42}{(x+2)(x-7)(x+5)}$$

$$\frac{2x^2+2x-40}{(x+2)(x-7)(x+5)}$$

$$2(x^2+x-20)$$

$$2(x+5)(x-4)$$

$$(x+2)(x-7)(x+5)$$

$$\boxed{\frac{2(x-4)}{(x+2)(x-7)}}$$

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

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

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

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

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

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

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

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