

Practice

Name: Key

Date/Pd: _____

Find the LCD of the two rational expressions.

1. $\frac{5}{2x+1}$ and $\frac{6}{4x^2-1}$

$(2x-1)(2x+1)$

2. $\frac{7}{x-6}$ and $\frac{3}{x^2-8x+12}$

$(x-6)(x-2)$

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

$(x-1)(x+1)$

LCD: $(2x-1)(2x+1)$

LCD: $(x-6)(x-2)$

LCD: $x(x-1)(x+1)$

Perform the indicated operations and simplify.

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

LCD: $x+3$

$$\frac{4x+12-5}{x+3}$$

$$\boxed{\frac{4x+7}{x+3}}$$

5. $\frac{4}{x^2-25} + \frac{2}{x+5} \cdot \frac{(x-5)}{(x-5)}$

$$\frac{4+2x-10}{(x-5)(x+5)}$$

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

LCD: $(x-5)(x+5)$

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

LCD: $(x-1)(x+2)$

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

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

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

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

7. $\frac{(x-4)9}{(x-4)4x} - \frac{x^2(4x)}{x-4(4x)}$

LCD: $(4x)(x-4)$

$$\frac{9x-36-4x^3}{4x(x-4)}$$

$$\boxed{\frac{-4x^3+9x-36}{4x(x-4)}}$$

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

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

$$\frac{5x+15 + 9x+3 - 2(x^2-x-12)}{3(x-4)(x+3)}$$

$$\frac{14x+18 - 2x^2 + 2x + 24}{3(x-4)(x+3)}$$

$$\frac{-2x^2 + 16x + 42}{3(x-4)(x+3)} = \frac{-2(x^2 - 8x - 21)}{3(x-4)(x+3)}$$

Solve the rational equation.

6. $\frac{2}{x-10} - \frac{3}{x-2} = \frac{6}{x^2-12x+20}$ $x \neq 10, 2$
 LCD: $(x-2)(x-10)$

$$2(x-2) - 3(x-10) = 6$$

$$2x - 4 - 3x + 30 = 6$$

$$-x + 26 = 6$$

$$-26 \quad -26$$

$$-x = -20$$

$$x = 20 \quad \boxed{\{20\}}$$

10. $\frac{4}{x-2} - \frac{3}{x+1} = \frac{8}{x^2-x-2}$ $x \neq 2, -1$
 LCD: $(x-2)(x+1)$

$$(x+1)4 - 3(x-2) = 8$$

$$4x+4 - 3x+6 = 8$$

$$x+10 = 8$$

$$x = -2$$

$$\boxed{\{-2\}}$$

9. $\frac{2}{x} + \frac{3x+1}{x^2} - \frac{x-2}{x^3}$ LCD: x^3

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

$$\frac{2x^2 + 3x^2 + x - x - 2}{x^3}$$

$$\boxed{\frac{5x^2 - 2}{x^3}}$$

7. $\frac{x}{2x-1} = \frac{3}{x+2}$ $x \neq \frac{1}{2}, -2$

$$x(x+2) = 3(2x-1)$$

$$x^2 + 2x = 6x - 3$$

$$x^2 - 4x + 3 = 0$$

$$(x-3)(x-1) = 0$$

$$x = 3 \quad x = 1$$

$$\boxed{\{1, 3\}}$$

11. $\frac{100-4x}{3} = \frac{5x+6}{4} + 6$

- No restrictions on x
 - LCD: 12

$$4(100-4x) = 3(5x+6) + 12(6)$$

$$400 - 16x = 15x + 18 + 72$$

$$400 - 16x = 15x + 90$$

$$-90 + 10x + 16x - 90$$

$$310 = 31x$$

$$10 = x$$

$$\boxed{\{10\}}$$

$$10. \frac{x+1}{2x-3} = 2$$

$$2x-3=0$$

$$x \neq \frac{3}{2}$$

$$x+1 = 2(x-3)$$

$$x+1 = 2x-6$$

$$-x = -7$$

$$x = 7$$

$$\boxed{\{7\}}$$

$$11. \frac{x}{3x-5} = \frac{2}{x-1} \quad x \neq 1, \frac{5}{3}$$

$$x^2 - x = 6x - 10$$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$$x = 5 \quad x = 2$$

$$\boxed{\{2, 5\}}$$

$$12. \frac{3}{x-8} - \frac{4}{x-2} = \frac{28}{x^2-10x+16}$$

$$x \neq 2, 8$$

$$\text{LCD: } (x-8)(x-2)$$

$$3(x-2) - 4(x-8) = 28$$

$$3x - 6 - 4x + 32 = 28$$

$$-x + 26 = 28$$

$$-x = 2$$

$$x = -2$$

$$\boxed{\{-2\}}$$

$$13. \frac{2x}{x+3} + \frac{5}{x} - 4 = \frac{18}{x^2+3x}$$

$$x \neq -3, 0$$

$$\text{LCD: } x(x+3)$$

$$2x^2 + 5(x+3) - 4(x)(x+3) = 18$$

$$2x^2 + 5x + 15 - 4x^2 - 12x = 18$$

$$-2x^2 - 7x + 15 = 18$$

$$\begin{array}{r} -18 \\ -18 \end{array}$$

$$\hline -2x^2 - 7x - 3 = 0$$

$$x = \frac{7 \pm \sqrt{49 - 4(-2)(-3)}}{2(-2)}$$

$$= \frac{7 \pm \sqrt{25}}{-4}$$

$$= \frac{7+5}{-4} \rightarrow \frac{7+5}{-4} \quad \frac{7-5}{-4}$$

$$\boxed{\{-\frac{1}{2}\}}$$

