Notes 7.2 Name: _____

Adding and Subtracting Rational Expressions:

- I can find the lowest common denominator (LCD) of a monomial
- I can find the LCD with a polynomial using factoring.
- I can add and subtract rational expressions by creating a LCD.
- I can simplify complex fractions using LCD's

Find the LCM of each monomial expression.

1) $12c, 6c^2d$

2) $18a^3bc^2, 24b^2c^2$

Find the LCM of each polynomial expression.

3) $2x - 6, x - 3$

$2(x-3)$; $(x-3)$ $\quad 2(x-3)$

4) $x^2 - 16, x - 4$

5) $x^2 + 6x + 8, x^2 - x - 6$

$(x+2)(x+4)$; $(x-3)(x+2)$ $\quad (x+2)(x+4)(x-3)$

6) $x + 1, x - 1$

7) $x^2 - 3x - 4, x + 1$

$(x-4)(x+1)$; $(x+1)$ $\quad (x-4)(x+1)$

Simplify each expression. (Like Denominators)

8) $\frac{x+5y}{24x} + \frac{x+6y}{24x}$ $= \frac{2x+11y}{24x}$

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

10) $\frac{k-2}{k-1} + \frac{3k+5}{k-1}$

11) $\frac{x+3}{x+16} - \frac{3x}{x+16}$

Simplify each expression. (Unlike Denominators)

12) $\frac{3}{6b^2} + \frac{4a}{5a}$ $= \frac{1}{2b^2} + \frac{4}{b}$

$\frac{5}{10b^2} + \frac{8b}{10b^2} = \frac{5+8b}{10b^2}$

13) $\frac{a-5b}{2a} - \frac{6a}{2a^2b}$

14) $\frac{4x}{5xy} - \frac{6x}{3xy^2}$

$= \frac{4}{5y} - \frac{2}{y^2} = \frac{4y}{15y^2} - \frac{10}{15y^2} = \frac{4y-10}{15y^2}$

15) $\frac{2x}{5y^2} - \frac{5x}{5}$

Simplify each expression.

16) $\frac{p-1}{2p+6} - \frac{3}{2}$ $= \frac{p-1}{2(p+3)} - \frac{3(p+3)}{2(p+3)}$

$2(p+3)$

$\frac{p-1-3p-9}{2(p+3)} = \frac{-2p-10}{2(p+3)} = \frac{-2(p+5)}{2(p+3)} = \frac{-(p+5)}{(p+3)}$

17) $\frac{3}{2n} - \frac{4}{2n+4}$

18) $\frac{4n}{3n} + \frac{6}{3n^2 - 9n}$ $= \frac{4}{3} + \frac{6}{3n(n-3)}$

$= \frac{4}{3} + \frac{2}{n(n-3)} = \frac{4n(n-3)}{3n(n-3)} + \frac{2 \cdot 3}{3n(n-3)}$

19) $\frac{6}{m+4} + \frac{2m}{m-2}$

20) $\frac{7}{3n-9} + \frac{n+4}{n^2-9}$ $= \frac{4n^2 - 12n + 6}{3n(n-3)}$

21) $\frac{4x}{x^2 + 9x + 18} + \frac{5}{x+6}$

22) $\frac{8}{y-3} + \frac{2y-5}{y^2 - 12y + 27}$

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

SIMPLIFYING COMPLEX FRACTIONS

A complex fraction is a fraction that contains a fraction in its numerator and/or denominator.

Method 1: If necessary, simplify the numerator and denominator by combining fractions w/ LCD. Then divide the numerator by the denominator.

Method 2: Multiply the numerator and the denominator by the LCD of every fraction in the numerator and denominator. Then simplify.

Simplify each expression. (Complex Fractions)

M1

24) $\frac{\frac{4}{x}}{\frac{3}{4} + \frac{x^2}{16}}$ $= \frac{\frac{4}{x}}{\frac{3(4)}{16} + \frac{x^2}{16}} = \frac{\frac{4}{x}}{\frac{12+x^2}{16}}$

$= \frac{4}{x} \cdot \frac{16}{12+x^2} = \frac{64}{x(12+x^2)}$

Method 2

25) $\frac{\frac{2}{u^2}}{\frac{2}{3} - \frac{9}{2}} \cdot \frac{6u^2}{6u^2} = \frac{12}{4u^2 - 27u^2}$

$= \frac{12}{-23u^2} = -\frac{12}{23u^2}$

26) $\frac{\frac{3}{m-3} + \frac{3}{2}}{\frac{m-3}{4}}$

27) $\frac{\frac{4}{x+5} - \frac{25}{2x+10}}{\frac{3}{5} - \frac{6}{25}}$