

Name: \_\_\_\_\_  
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Date: \_\_\_\_\_  
 Ms. Loughran

## Do Now:

Perform the indicated operations and give answer in simplest form.

$$\frac{a^2 - b^2}{2a^2 - ab - b^2} \cdot \frac{4a^2 - b^2}{2a^2 + ab - b^2} \div \frac{6a^2 - 5ab + b^2}{3a^2 + 2ab - b^2}$$

$$\frac{\cancel{(a+b)}\cancel{(a-b)}}{\cancel{(a-b)}\cancel{(2a+b)}} \cdot \frac{\cancel{(2a-b)}\cancel{(2a+b)}}{\cancel{(2a-b)}\cancel{(a+b)}} \cdot \frac{\cancel{(3a-b)}(a+b)}{\cancel{(3a-b)}(2a-b)}$$

$\frac{a+b}{2a-b}$

$$a \neq b, \frac{+b}{2}, \frac{+b}{3}$$

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$2a^2 - ab - b^2$ $2a^2 - 2ab + ab - b^2$ $2a(a-b) + b(a-b)$ $(a-b)(2a+b)$	$2a^2 + ab - b^2$ $2a^2 + 2ab - ab - b^2$ $2a(a+b) - b(a+b)$ $(2a-b)(a+b)$	$6a^2 - 5ab + b^2$ $6a^2 - 3ab - 2ab + b^2$ $3a(2a-b) - b(2a-b)$ $(3a-b)(2a-b)$	$3a^2 + 2ab - b^2$ $3a^2 + 3ab - ab - b^2$ $3a(a+b) - b(a+b)$ $(3a-b)(a+b)$
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Continuing in yesterday's packet...

$$\begin{matrix} (3x+4) \\ 17) \end{matrix} \frac{3}{8} + \frac{-3}{(3x+4)8}$$

$$\frac{9x+12-24}{8(3x+4)}$$

$$\frac{9x-12}{8(3x+4)} = \frac{3(3x-4)}{8(3x+4)} \quad x \neq -\frac{4}{3}$$

$$\begin{matrix} (x-2) \\ 19) \end{matrix} \frac{3}{(x+6)} + \frac{7}{(x-2)(x+6)}$$

$$\frac{3x-b+7x+42}{(x+b)(x-2)}$$

$$\frac{10x+3b}{(x+b)(x-2)} \quad x \neq -b, 2$$

or

$$\frac{2(5x+18)}{(x+b)(x-2)}$$

$$21) \frac{8(n+1)}{5n+5} + \frac{7n}{3n}$$

$$\frac{5(n^2+7n-8)}{8(n+8)(n-1)}$$

$$\frac{3(n+1)}{3(n+8)(n-1)} + \frac{7(n^2+7n-8)}{3(n+8)(n-1)}$$

$$\frac{3n+3+7n^2+49n-56}{3(n+8)(n-1)} = \frac{7n^2+52n-53}{3(n+8)(n-1)}$$

$n \neq -8, 1, 0$

$$\begin{matrix} (b+3) \\ 18) \end{matrix} \frac{3}{(b-8)} + \frac{7}{(b+3)(b-8)}$$

$$\frac{3b+9+7b-56}{(b-8)(b+3)}$$

$$\frac{10b-47}{(b-8)(b+3)}, \quad b \neq 8, -3$$

$$\begin{matrix} (x+2) \\ 20) \end{matrix} \frac{4}{(x+1)} + \frac{-2}{(x+2)(x+1)}$$

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

$$\frac{2x+6}{(x+1)(x+2)} \quad x \neq -1, -2$$

or

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

$$\begin{matrix} (3n-8) \\ 22) \end{matrix} \frac{3}{(n-5)} + \frac{6}{(3n-8)(n-5)}$$

$$\frac{9n-24+6n-30}{(n-5)(3n-8)}$$

$$\frac{15n-54}{(n-5)(3n-8)} \quad n \neq 5, \frac{8}{3}$$

$\frac{3(5n-18)}{(n-5)(3n-8)}$

# Homework 09-27

$$2) \frac{m-3n}{6m^3n} + \frac{m+3n}{6m^3n} = \frac{-6n}{6m^3n} = \frac{-1}{m^3} \quad m, n \neq 0$$

$$4) \frac{5}{10n^2+16n+6} + \frac{n-6}{10n^2+16n+6} = \frac{n-1}{10n^2+16n+6} = \frac{n-1}{2(5n+3)(n+1)} \quad n \neq -\frac{3}{5}, -1$$

$$6) \frac{x+2}{2x^2+13x+20} + \frac{-x+3}{2x^2+13x+20} = \frac{-1}{2x^2+13x+20} = \frac{-1}{(x+4)(2x+5)} \quad x \neq -4, -\frac{5}{2}$$

$* 2x^2+5x+8x+20$   
 $x(2x+5)+4(2x+5)$   
 $(x+4)(2x+5)$

$$8) \frac{6}{1} + \frac{-x+5}{(7x-5)(x+4)} = \frac{6(7x-5)(x+4) - x+5}{(7x-5)(x+4)} = \frac{42x^2+138x-120-x+5}{(7x-5)(x+4)}$$

$$10) \frac{3}{4v^2+4v} + \frac{-7}{2} = \frac{3-14v^2-14v}{4v(v+1)} = \frac{-14v^2-14v+3}{4v(v+1)} = \frac{-(14v^2+14v-3)}{4v(v+1)} \quad v \neq 0, -1$$

$2v^2+2v$   
 $2v(v+1)$   
 $4v(v+1)$

$$\frac{3-14v^2-14v}{4v(v+1)} = \frac{-14v^2-14v+3}{4v(v+1)} = \frac{-(14v^2+14v-3)}{4v(v+1)} \quad v \neq 0, -1$$

# Adding and Subtracting Rational Expressions Key

①

$$\textcircled{1} \frac{u-v}{8v} + \frac{6u-3v}{8v} = \frac{7u-4v}{8v} \quad v \neq 0.$$

$$\textcircled{2} \frac{m-3n}{6m^3n} \oplus \ominus \frac{-m+3n}{6m^3n} = \frac{-6n}{6m^3n} = \frac{-1}{m^3} \quad n \neq 0, m \neq 0$$

$$\textcircled{3} \frac{5}{a^2+3a+2} + \frac{5a+1}{a^2+3a+2} = \frac{5a+6}{a^2+3a+2} = \frac{5a+6}{(a+2)(a+1)} \quad a \neq -1, -2$$

$$\textcircled{4} \frac{5}{10n^2+16n+6} + \frac{n-6}{10n^2+16n+6} = \frac{n-1}{10n^2+16n+6} = \frac{n-1}{2(5n^2+8n+3)} \quad n \neq -1, -\frac{3}{5}$$

$$\textcircled{5} \frac{r+6}{3r-6} + \frac{r+1}{3r-6} = \frac{2r+7}{3r-6} \quad r \neq 2$$

$$\textcircled{6} \frac{x+2}{2x^2+13x+20} \oplus \ominus \frac{-x+3}{2x^2+13x+20} = \frac{-1}{2x^2+13x+20} \quad 2x^2+13x+20 \neq 0, -4$$

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

$$\textcircled{7} \textcircled{4} \frac{6}{x-1} - \frac{5x(x-1)}{4(x-1)}$$

$$\frac{24}{4(x-1)} \oplus \ominus \frac{-5x^2+5x}{4(x-1)} = \frac{-5x^2+5x+24}{4(x-1)} \quad x \neq 1$$

$$\textcircled{8} \frac{6}{(7x-5)(x+4)} - \frac{x+5}{(7x-5)(x+4)} = \frac{42x^2+138x-120}{(7x-5)(x+4)} \oplus \ominus \frac{-x+5}{(7x-5)(x+4)} = \frac{42x^2+137x-125}{(7x-5)(x+4)}$$

$$x \neq \frac{5}{7}, -4$$

②

$$\textcircled{9} \frac{3(x-8)}{(x+7)(x-8)} + \frac{4(x+7)}{(x-8)(x+7)}$$

$$\frac{3x-24}{(x+7)(x-8)} + \frac{4x+28}{(x+7)(x-8)} = \frac{7x+4}{(x+7)(x-8)} \quad x \neq -7, 8$$

$$\star \textcircled{10} \frac{3}{4v^2+4v} - \frac{7(2v(v+1))}{2(2v(v+1))}$$

$$4v(v+1)$$

$$\frac{3}{4v(v+1)} \ominus \frac{-14v^2+14v}{4v(v+1)} = \frac{-14v^2-14v+3}{4v(v+1)} \quad v \neq 0, -1$$

$$\textcircled{11} \frac{7}{3(3x-2)} - \frac{8}{4(3x-2)}$$

$$\frac{12x-8}{4(3x-2)} (3)$$

$$\frac{84x-56}{12(3x-2)} \ominus \frac{24}{12(3x-2)} = \frac{84x-80}{12(3x-2)} = \frac{4(21x-20)}{12(3x-2)} = \frac{21x-20}{3(3x-2)}$$

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

$$\star \textcircled{12} \frac{5}{2(n+3)} + \frac{4n}{2(n+3)}$$

$$\frac{2n+6}{2(n+3)(n+3)}$$

n ≠ -5, -3

$$\frac{10n+30}{2(n+5)(n+3)} + \frac{4n^2+20n}{2(n+5)(n+3)} = \frac{4n^2+30n+30}{2(n+5)(n+3)} = \frac{2(2n^2+15n+15)}{2(n+5)(n+3)}$$

$$\textcircled{13} \frac{2x^{(2x+3)}}{(2x+3)(5x+4)} + \frac{6x(5x+4)}{(2x+3)(5x+4)}$$

$$x \neq -\frac{4}{5}, -\frac{3}{2}$$

$$\frac{4x^2+6x}{(5x+4)(2x+3)} + \frac{30x^2+24x}{(5x+4)(2x+3)} = \frac{34x^2+30x}{(5x+4)(2x+3)}$$

$$\textcircled{14} \frac{2}{3x^2+12x} + \frac{8}{2x(3(x+4))}$$

z)  $3x(x+4)$

$$x \neq 0, -4$$

$$\frac{4}{6x(x+4)} + \frac{24x+96}{6x(x+4)} = \frac{24x+100}{6x(x+4)} = \frac{2(12x+50)}{6x(x+4)} = \frac{12x+50}{3x(x+4)}$$

$$\textcircled{15} \frac{7n^{(n-7)}}{(n+1)(n-7)} + \frac{8}{n-7(n+1)}$$

$$\frac{7n^2-49n}{(n+1)(n-7)} + \frac{8n+8}{(n+1)(n-7)} = \frac{7n^2-41n+8}{(n+1)(n-7)} \quad n \neq -1, 7$$

$$\textcircled{16} \frac{2^{(n+1)}}{(n+1)(n+8)} + \frac{4}{(n+1)(n+8)}$$

$$\frac{2n+2}{(n+8)(n+1)} + \frac{4n+32}{(n+8)(n+1)} = \frac{6n+34}{(n+8)(n+1)} \quad n \neq -8, -1$$

(4)

$$(17) \frac{3(3x+4)}{(3x+4)8} - \frac{3(8)}{(3x+4)(8)}$$

$$\frac{2(3)(4)}{6(4)}$$

$$\frac{9x+12}{8(3x+4)} - \frac{24}{8(3x+4)} = \frac{9x-12}{8(3x+4)} \quad x \neq -\frac{4}{3}$$

$$(18) \frac{3(b+3)}{(b-8)(b+3)} + \frac{7(b-8)}{(b+3)(b-8)}$$

$$\frac{3b+9}{(b-8)(b+3)} + \frac{7b-56}{(b-8)(b+3)} = \frac{10b-47}{(b-8)(b+3)} \quad b \neq 8, -3$$

$$(19) \frac{3(x-2)}{(x+6)(x-2)} + \frac{7(x+6)}{(x-2)(x+6)}$$

$$\frac{3x-6}{(x+6)(x-2)} + \frac{7x+42}{(x+6)(x-2)} = \frac{10x+36}{(x+6)(x-2)} \quad x \neq -6, 2$$

$$(20) \frac{4(x+2)}{(x+1)(x+2)} - \frac{2(x+1)}{(x+2)(x+1)}$$

$$\frac{4x+8}{(x+1)(x+2)} - \frac{2x+2}{(x+1)(x+2)} = \frac{2x+6}{(x+1)(x+2)} \quad x \neq -1, -2$$

$$\begin{aligned}
 & \textcircled{21} \quad \frac{5n+5}{5n^2+35n-40} + \frac{35(n^2+7n-8)}{5(n+8)(n-1)} \\
 & \quad \quad \quad \frac{5(n^2+7n-8)}{5(n+8)(n-1)}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{15n+15}{15(n+8)(n-1)} + \frac{35n^2+245n-280}{15(n+8)(n-1)} - \frac{5(7n^2+52n-53)}{3(n+8)(n-1)} \\
 & \quad \quad \quad \frac{35n^2+260n-265}{3(n+8)(n-1)} \\
 & \quad \quad \quad \frac{7n^2+52n-53}{3(n+8)(n-1)}
 \end{aligned}$$

$n \neq 1, -8, 0$

$$\textcircled{22} \quad \frac{3(3n-8)}{(3n-8)(n-5)} + \frac{6(n-5)}{(3n-8)(n-5)}$$

$$\frac{9n-24}{(3n-8)(n-5)} + \frac{6n-30}{(3n-8)(n-5)} = \frac{15n-54}{(3n-8)(n-5)} \quad n \neq \frac{8}{3}, 5$$

$$\frac{3n+3+7n^2+49n-56}{3(n+8)(n-1)}$$