Precalculus
Unit 7 Day 2 Homework:
Adding and Subtracting Rational Expressions

Name:_____
Date:_____Period:_____

1. Explain ***how*** to add rational expressions with unlike denominators.

Perform the indicated operation and then simplify.

2. $\frac{9}{x+1}-\frac{2x}{x+1}$

$\frac{9-2x}{x+1}$

3. $\frac{5x}{x+3}+\frac{15}{x+3}$

$\frac{5\cancel{(x+3)}}{\cancel{(x+3)}} = 5$

4. What is the Least Common Multiple of the polynomials $3x^2-9x$ and $6x^2$?

A. $3x(x-3)$ B. $6x^2$ C. $6x(x-3)$ D. $6x^2(x-3)$

Perform the indicated operation and then simplify.

5. $\frac{12}{5x}+\frac{7}{6x}$

$\frac{72+35}{30x} = \frac{107}{30x}$

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

$\frac{24-5x}{9x^2}$

7. $\frac{3}{x+4}+\frac{-1}{x+6}$

$\frac{2x+14}{(x+4)(x+6)}$

8. $\frac{-15x}{x^2-8x+16}+\frac{12}{x-4}$

$\frac{-3x-48}{(x-4)^2}$

9. Which expression is equivalent to $\frac{2x}{x+4} - \frac{x^2+4}{x^2-16}$?

A. $\frac{1}{x+4}$ B. $\frac{(x+2)(x-2)}{(x+4)(x-4)}$ C. $\frac{x^2-8x-4}{(x+4)(x-4)}$ D. $\frac{3x^2-8x+4}{(x+4)(x-4)}$

Perform the indicated operation and then simplify.

10. $\frac{x}{x^2-9} + \frac{x+1}{x^2+6x+9}$

$(x+3)$ $(x-3)$

$(x+3)(x-3)$ $(x+3)^2$

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

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

11. $\frac{x+2}{x-4} + \frac{2}{x} + \frac{-5x}{3x-1}$

$x(3x-1)$ $(x-4)(3x-1)$ $(x)(x-4)$

$x(3x^2+6x-x-2)$ $+2(3x^2-x-12x+4)-5x^2(x-4)$

$3x^3+5x^2-2x+6x^2-26x+8-5x^3+20x^2$

$\frac{-2x^3+31x^2-28x+8}{x(x-4)(3x-1)}$

12. $\frac{x+3}{x^2-2x-8} + \frac{-x+5}{x^2-12x+32}$

$(x+8)$ $(x+2)$

$(x-4)(x+2)$ $(x-4)(x+8)$

$\frac{x^2-5x-24-x^2+3x+10}{(x-4)(x+2)(x-8)}$

$\frac{-2x-14}{(x-4)(x+2)(x-8)}$

13. $\frac{x+3}{x^2-25} + \frac{-x+1}{x-5} + \frac{3}{x+3}$

$(x+3)$ $(x+5)(x+3)$ $(x+5)(x-5)$

$(x+5)(x-5)$

$x^6+6x+9+(-x+1)(x^2+8x+15)+3x^2-75$

$x^2+6x+9-x^3-7x^2-7x+15+3x^2-75$

$\frac{-x^3-3x^2-x-51}{(x+5)(x-5)(x+3}$

14. $\frac{2}{x-3}+\frac{3}{x-3}$

$\frac{5}{x-3}$

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

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

16. $\frac{2}{3x}+\frac{x-7}{3x}$

$\frac{x-5}{3x}$

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

$(x-3)(x-1)$

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

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

$\frac{6x-5}{(x-3)(x-1)}$

18. $\frac{3x}{x-5}+\frac{-2}{x^2-25}$ $(x+5)$

$(x+5)(x-5)$

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

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

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

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

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

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

20. $\frac{3}{x} + \frac{x+2}{x^2}$

(x)

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

$\frac{4x+2}{x^2}$

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

$(x+4)$

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

$\frac{6-3x-12}{x+4}$

$\frac{-3x-6}{x+4}$

22. $\frac{x}{x-4} + \frac{-x-3}{x+2}$

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

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

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

$\frac{6x-3x+12}{(x+2)(x-4)}$

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

24. $\frac{x+1}{3x+12} + \frac{5}{3}$

$(x+4)$

$3(x+4)$

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

$\frac{x+1+5x+20}{3(x+4)}$

$\frac{6x+21}{3(x+4)}$

$\frac{\cancel{3}(2x+7)}{\cancel{3}(x+4)} = \frac{2x+7}{x+4}$

25. $\frac{4}{3x+6} + \frac{x-1}{x^2+2x}$

(x) (3)

$3(x+2)$ $x(x+2)$

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

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

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

26. $\frac{x}{x+3} + \frac{-3}{x+2} + \frac{-1}{x^2+5x+6}$

$(x+2)$ $(x+3)$

$(x+3)(x+2)$

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

$\frac{x^2+2x-3x-9-1}{(x+3)(x+2)}$

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