Name _____ Class _____ Date _____

11-4 Reteaching

Adding and Subtracting Rational Expressions

Problem

What is the difference $\frac{x+1}{2x+1} - \frac{2-x}{2x+1}$?

$\frac{x+1}{2x+1} - \frac{2-x}{2x+1}$ The fractions have like denominators.

$= \frac{x+1-(2-x)}{2x+1}$ Subtract the numerators.

$= \frac{x+1-2+x}{2x+1}$ Distributive Property

$= \frac{2x-1}{2x+1}$ Simplify the numerator.

Adding or subtracting rational expressions is similar to adding or subtracting fractions. First find a common denominator, the LCD. Once the denominator is the same, the numerators can be added to or subtracted from one another. Since numerators and denominators are multiplied by the same number, it is the same as multiplying by 1. After adding or subtracting numerators, simplify, and reduce the rational expressions.

For example: $\frac{1}{2b} + \frac{3}{b} = \frac{1}{2b} + \left(\frac{2}{2} \cdot \frac{3}{b}\right) = \frac{1}{2b} + \frac{6}{2b} = \frac{1+6}{2b} = \frac{7}{2b}$

Problem

What is the sum $\frac{5}{8x^2} + \frac{2}{3x^2}$?

$\frac{5}{8x^2} + \frac{2}{3x^2}$ Because the fractions have different denominators, find the lowest common denominator (LCD). The LCD is the smallest number that both factors have in common.

In this case, $(8 \cdot 3)x^2$ or $24x^2$ is the LCD. The common denominator is $24x^2$.

$= \frac{3}{3} \cdot \frac{5}{8x^2} + \frac{8}{8} \cdot \frac{2}{3x^2}$ Rewrite each fraction using the LCD. $8x^2$ needs to be multiplied by 3 to equal $24x^2$. And $3x^2$ needs to be multiplied by 8 to equal $24x^2$.

Notice that $\frac{3}{3} = 1$ and $\frac{8}{8} = 1$.

$= \frac{15}{24x^2} + \frac{16}{24x^2}$ Simplify numerators and denominators.

$= \frac{15+16}{24x^2}$ Add the numerators.

$= \frac{31}{24x^2}$ Simplify.

Name _____ Class _____ Date _____

11-4 Reteaching (continued)

Adding and Subtracting Rational Expressions

Exercises

Add.

1. $\frac{4}{p} + \frac{9}{p}$ $\frac{13}{p}$

2. $\frac{2.5}{x} + \frac{1.25}{x}$ $\frac{3.75}{x}$

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

4. $\frac{j^2}{jm^2n} + \frac{3m}{jm^2n} + \frac{2n^3}{jm^2n}$ $\frac{j^2 + 3m + 2n^3}{jm^2n}$

5. $\frac{1}{2a} + \frac{2}{a}$ $\frac{5}{2a}$

6. $\frac{7}{3d} + \frac{3}{7d}$ $\frac{58}{21d}$

7. $\frac{1}{12m} + \frac{3}{4m}$ $\frac{5}{6m}$

8. $\frac{3}{7s} + \frac{11}{4s}$ $\frac{89}{28s}$

9. $\frac{8.9}{16t} + \frac{2.1}{9t}$ $\frac{113.7}{144t}$

10. $\frac{5}{x} + \frac{x}{x^2}$ $\frac{6}{x}$

11. $\frac{3}{n+1} + \frac{4}{n+2}$ $\frac{7n + 10}{(n + 1)(n + 2)}$

12. $\frac{2x}{x^2 - 9} + \frac{4x + 1}{x + 3}$ $\frac{4x^2 - 9x - 3}{x^2 - 9}$

Subtract.

13. $\frac{2}{y} - \frac{5}{3y}$ $\frac{1}{3y}$

14. $\frac{1}{2x} - \frac{1}{3x}$ $\frac{1}{6x}$

15. $\frac{n - 1}{2} - \frac{2n}{4}$ $-\frac{1}{2}$

16. $\frac{3}{7y} - \frac{6}{3y}$ $\frac{-11}{7y}$

17. $\frac{11}{2p} - \frac{1}{12p}$ $\frac{65}{12p}$

18. $\frac{4}{x+2} - \frac{2}{x-8}$ $\frac{2x - 36}{x^2 - 6x - 16}$

19. $\frac{10}{x+5} - \frac{x+1}{2x}$ $\frac{-x^2 + 14x - 5}{2x(x + 5)}$

20. $\frac{3x}{2} - \frac{x}{14x}$ $\frac{(21x - 1)}{14}$

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

22. $\frac{5k}{2} - \frac{6}{k}$ $\frac{5k^2 - 12}{2k}$