

Math 95 HW 12 (6.3) Addition and Subtraction of Rational Expressions

Name: _____

Concepts and Vocabulary:

3. What is the LCM of $x^2 - 25$ and $x + 5$

5. What do you need to find before you can add $\frac{1}{4}$ and $\frac{1}{3}$?

Least Common Multiples:

In exercises 11 - 19, Determine the least common multiple of the given expressions.

11. 10, 15

17. $10x^2$, $25(x^2 - x)$

15. $6a$, $9a^2$

19. $x^2 + 2x + 1$, $x^2 - 4x - 5$

Fraction Review:

In exercises 25 and 29, add and subtract the fraction as indicated.

25. $\frac{2}{3} + \frac{5}{6} + \frac{1}{4}$

29. $\frac{3}{2} - \frac{1}{8}$

Addition and Subtraction of Rational Expressions:

In exercises 31 - 83, add or subtract the rational expressions as indicated. Simplify the expression when possible and, if you do, state any domain restrictions necessary so that the expressions truly are equivalent.

31. $\frac{1}{x} + \frac{3}{x}$

33. $\frac{2}{x^2 - 4} - \frac{x + 1}{x^2 - 4}$

$$35. \frac{4}{x^2} + \frac{5}{x^2}$$

$$49. \frac{4}{n-4} + \frac{3}{2-n}$$

$$39. \frac{x}{x+1} + \frac{1}{x+1}$$

$$51. \frac{x}{x+4} - \frac{x+1}{x}$$

$$43. \frac{4r}{5t^2} + \frac{r}{5t^2}$$

$$53. \frac{2}{x^2} - \frac{4x-1}{x}$$

$$55. \frac{x+3}{x-5} + \frac{5}{x-3}$$

$$67. \frac{3}{(x-1)(x-2)} + \frac{4x}{(x+1)(x-2)}$$

$$59. \frac{x}{x^2-9} + \frac{5x}{x-3}$$

$$69. \frac{3}{x^2-x-6} - \frac{2}{x^2+5x+6}$$

$$63. \frac{2x}{x-5} + \frac{2x-1}{3x^2-16x+5}$$

$$71. \frac{3}{x^2-2x+1} + \frac{1}{x^2-3x+2}$$

$$77. 5 - \frac{6}{n^2 - 36} + \frac{3}{n - 6}$$

$$81. \frac{5}{2x - 3} + \frac{x}{x + 1} - \frac{x}{2x - 3}$$

Supplemental Problems:

S1. Let $S(x) = \frac{x + 1}{x - 3}$ and $R(x) = \frac{2}{x + 2}$.

- a. If $a(x) = S(x) + R(x)$, find a simplified expression for $a(x)$ and state the domain of a using set notation.
- b. If $b(x) = S(x) - R(x)$, find a simplified expression for $b(x)$ and state the domain of b using set notation.
- c. If $c(x) = S(x) \cdot R(x)$, find a simplified expression for $c(x)$ and state the domain of c using set notation.
- d. If $d(x) = \frac{S(x)}{R(x)}$, find a simplified expression for $d(x)$ and state the domain of d using set notation.

Solutions to Supplemental Problems:

S1.

a. $a(x) = \frac{x^2 + 5x - 4}{(x + 2)(x - 3)},$

$$D = \{x|x \neq -2 \text{ and } x \neq 3\}$$

c. $c(x) = \frac{2(x + 1)}{(x + 2)(x - 3)},$

$$D = \{x|x \neq -2 \text{ and } x \neq 3\}$$

b. $b(x) = \frac{x^2 + x + 8}{(x + 2)(x - 3)},$

$$D = \{x|x \neq -2 \text{ and } x \neq 3\}$$

d. $d(x) = \frac{(x + 1)(x + 2)}{2(x - 3)},$

$$D = \{x|x \neq 3, x \neq -2\}$$