

Accelerated 65 - 95 HW 31 (R 4.3) 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  $R(x) = \frac{2}{x + 2}$ .

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

**Solutions to Supplemental Problems:**

S1.

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

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

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

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

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

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

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

$$D = \{x|x \neq 3\}$$