

Objectives

- Add and subtract rational expressions with the same denominator.
- Find the least common denominator.
- Add and subtract rational expressions with different denominators.



7.2 Adding and Subtracting Rational Expressions

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Example 1

Add or subtract as indicated.

$$\frac{7x}{9} + \frac{y}{9}$$

$$\frac{x^2}{x-3} - \frac{9}{x-3}$$

Example 2

Add or subtract as indicated.

$$\frac{6}{x^2 + 3x - 18} + \frac{x}{x^2 + 3x - 18}$$

Find a Least Common Denominator

- Suppose that the given expressions are denominators of fractions. Find the LCD for each group of denominators.

$$15m^3n, 10m^2n$$

$$z, z + 6$$

Example 3

- Suppose that the given expressions are denominators of fractions. Find the LCD for each group of denominators.

$$m^2 - 16, m^2 + 6m + 8$$

Example 4

- Suppose that the given expressions are denominators of fractions. Find the LCD for each group of denominators.

$$x^2 - 2x + 1,$$

$$x^2 - 4x + 3,$$

$$4x - 4$$

ADDING & SUBTRACTING

1

Find the _____
by factoring each denominator. *(The LCD is the product of all the different factors from each denominator.)*

2

_____ each term with the least
**common denominator then add or
subtract the numerators.** *(Place the result over
the common denominator.)*

3

_____. **Write all answers in lowest
terms.**

Example 5

Add or subtract as indicated.

$$\frac{7}{15} + \frac{5}{12}$$

Example 6

Add or subtract as indicated.

$$\frac{2}{3x} + \frac{7}{4x}$$

Example 7

Subtract.

$$\frac{3}{z} - \frac{6}{z-5}$$

Example 8

Subtract.

$$\frac{5x + 7}{2x + 7} - \frac{-x - 14}{2x + 7}$$

Example 9

Subtract.

$$\frac{2}{r-2} - \frac{r+3}{r-1}$$

Example 10

Add.

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

Example 11

Add and subtract as indicated.

$$\frac{4}{x-5} + \frac{-2}{x} - \frac{10}{x^2-5x}$$

Example 12

Add and subtract as indicated.

$$\frac{8x}{x-3} + \frac{144}{x^2-9} - \frac{8x}{x+3}$$

Example 13

Add and subtract as indicated.

$$-\frac{a}{a^2 + 3a - 4} \quad - \quad \frac{4a}{a^2 + 7a + 12}$$

Example 14

Add and subtract as indicated.

$$\frac{2}{x+5} + \frac{5}{7x} + \frac{10}{x^2+5x}$$

Example 15

Add and subtract as indicated.

$$\frac{2}{m^2 - 6m + 9} + \frac{4}{m^2 + m - 12}$$