How to Add or Subtract Similar Rational Expressions:

- 1. Copy the denominator.
- 2. Add or subtract the numerators.
- 3. Simplify the result.

In symbols, $\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}$. How to Add or Subtract Dissimilar Rational Expressions:

- 1. Change the expressions into similar rational algebraic expressions using the least common denominator or
- 2. Proceed as in adding or subtracting similar fractions.

Practice Exercises 1.4.2

Perform the indicated operation.

1.
$$\frac{6}{2\alpha-6} + \frac{4}{2\alpha-6}$$
 6. $\frac{3}{x+1} + \frac{4}{x}$
2. $\frac{x^2+3x-2}{x^2-4} + \frac{x^2+2x+4}{x^2-4}$ 7. $\frac{x+8}{x^2-4x+4} + \frac{3x-2}{x^2-4}$

6.
$$\frac{3}{x+1} + \frac{4}{x}$$
7. $\frac{x+8}{3}$

3.
$$\frac{7}{4x-2} - \frac{5}{4x-2}$$
$$x^2 + 3x + 2 \qquad 3x + 3$$

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

3.
$$\frac{7}{4x-2} - \frac{3}{4x-2}$$
8. $\frac{2x}{x^2-9} - \frac{3}{x-3}$
4. $\frac{x^2+3x+2}{x^2-2x+1} - \frac{3x+3}{x^2-2x+1}$
9. $\frac{3}{x^2-x-2} - \frac{2}{x^2-5x+6}$
5. $\frac{x-2}{x-1} + \frac{1}{x-1}$
10. $\frac{x+2}{x} - \frac{x+2}{2}$

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

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

10.
$$\frac{x+2}{x} - \frac{x+2}{2}$$

Activity 1.4.2

Perform the indicated operation.

1.
$$\frac{6}{3a-9} - \frac{3}{3a-9}$$
2.
$$\frac{x^2 - 3x - 7}{x^2 - 9} + \frac{x^2 - 2x + 4}{x^2 - 9}$$

6.
$$\frac{a}{a-b} - \frac{b}{a+b}$$

2.
$$\frac{x^2 - 3x - 7}{x^2 - 9} + \frac{x^2 - 2x + 7}{x^2 - 9}$$

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

7.
$$\frac{3}{2x+1} + \frac{5}{3x-2}$$

8. $\frac{3\alpha+12}{2\alpha-8} + \frac{\alpha+4}{\alpha-4}$

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

8. $\frac{3\alpha+12}{2\alpha-8} + \frac{\alpha-1}{\alpha-1}$

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

9. $\frac{y+1}{y} + \frac{y-1}{y+1}$

5. $\frac{x-2}{x-4} - \frac{2}{x-4}$

10. $\frac{2x}{x^2-4x+4} - \frac{2x+6}{x^2-4x+4}$

9.
$$\frac{y+1}{v} + \frac{y-1}{v+1}$$

$$5. \ \frac{x-2}{x-4} - \frac{2}{x-4}$$

10.
$$\frac{2x}{x^2 - 4x + 4} - \frac{1}{x - 2}$$

Lesson 1.4.2: Addition and Substraction of Rational **Algebraic Expressions**

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1.
$$\frac{6}{2a-6} + \frac{4}{2a-6}$$

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

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

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

3. $\frac{7}{4x-2} - \frac{5}{4x-2}$
4. x^2+3x+2 $3x+3$

$$\frac{x^{2}+3x-2}{x^{2}-4} + \frac{x^{2}+2x+4}{x^{2}-4} \quad 7. \quad \frac{x+8}{x^{2}-4x+4} + \frac{3x-2}{x^{2}-4}$$

$$\frac{7}{4x-2} - \frac{5}{4x-2} \quad 8. \quad \frac{2x}{x^{2}-9} - \frac{3}{x-3}$$

$$4x-2 \quad 4x-2 \quad x^{2}-9 \quad x-3$$
4.
$$\frac{x^{2}+3x+2}{x^{2}-2x+1} - \frac{3x+3}{x^{2}-2x+1} \quad 9. \quad \frac{3}{x^{2}-x-2} - \frac{2}{x^{2}-5x+6}$$
5.
$$\frac{x-2}{x-1} + \frac{1}{x-1} \quad 10. \quad \frac{x+2}{x} - \frac{x+2}{2}$$

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

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

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

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$$\frac{a}{a-b} - \frac{b}{a+b}$$
7. $\frac{3}{2x+1} + \frac{5}{3x-2}$

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

9.
$$\frac{y+1}{y} + \frac{y-1}{y+1}$$

5.
$$\frac{x-2}{x-4} - \frac{2}{x-4}$$

$$\frac{7}{3x-6} - \frac{4}{3x-6}$$
8.
$$\frac{3a+12}{2a-8} + \frac{a+4}{a-4}$$

$$\frac{x^2+2x+2}{x^2-4x+4} - \frac{2x+6}{x^2-4x+4}$$
9.
$$\frac{y+1}{y} + \frac{y-1}{y+1}$$

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

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Practice Exercises 1.4.2

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

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

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

7.
$$\frac{x+8}{x^2-4x+4} + \frac{3x-2}{x^2-4}$$

2.
$$\frac{x^2 + 3x - 2}{x^2 - 4} + \frac{x^2 + 2x + 4}{x^2 - 4}$$
 7. $\frac{x + 6}{x^2 - 4x + 4} + \frac{3x - 2}{x^2 - 4}$
3. $\frac{7}{4x - 2} - \frac{5}{4x - 2}$ 8. $\frac{2x}{x^2 - 9} - \frac{3}{x - 3}$
4. $\frac{x^2 + 3x + 2}{x^2 - 2x + 1} - \frac{3x + 3}{x^2 - 2x + 1}$ 9. $\frac{3}{x^2 - x - 2} - \frac{2}{x^2 - 5x + 6}$
5. $\frac{x - 2}{x - 1} + \frac{1}{x - 1}$ 10. $\frac{x + 2}{x} - \frac{x + 2}{2}$

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

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$$\frac{a}{a-b} - \frac{b}{a+b}$$
7. $\frac{3}{2x+1} + \frac{5}{3x-2}$

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$$\frac{x^2 - 3x - 7}{x^2 - 9} + \frac{x^2 - 2x + 4}{x^2 - 9}$$
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$$\frac{7}{x^2 - 9} - \frac{4}{x^2 - 9}$$

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$$\frac{3a+12}{2a-8} + \frac{a+4}{a-4}$$

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$$\frac{7}{3x-6} - \frac{4}{3x-6}$$
4. $\frac{x^2+2x+2}{x^2-4x+4} - \frac{2x+6}{x^2-4x+4}$
5. $\frac{x-2}{x-4} - \frac{2}{x-4}$
10. $\frac{2x}{x^2-4x+4} - \frac{2x}{x^2-4x+4}$

9.
$$\frac{y+1}{y} + \frac{y-1}{y+1}$$

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$$\frac{3}{x+1} + \frac{1}{x}$$
7. $\frac{x+8}{x^2 - 4x + 4} + \frac{3x-2}{x^2 - 4}$

3.
$$\frac{7}{4x-2} - \frac{5}{4x-2}$$

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

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

$$\frac{4x-2}{4x-2} - \frac{4x-2}{4x-2} \qquad \text{o.} \quad \frac{x^2-9}{x^2-9} - \frac{x-3}{x-3}$$

$$\frac{x^2+3x+2}{x^2-2x+1} - \frac{3x+3}{x^2-2x+1} \qquad \text{o.} \quad \frac{3}{x^2-x-2} - \frac{2}{x^2-5x+6}$$

$$\frac{x-2}{x-1} + \frac{1}{x-1} \qquad \text{1o.} \quad \frac{x+2}{x} - \frac{x+2}{2}$$

5.
$$\frac{1}{x-1} + \frac{1}{x-1}$$

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Perform the indicated operation.

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$$\frac{6}{3\alpha - 9} - \frac{3}{3\alpha - 9}$$
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6.
$$\frac{a}{a-b} - \frac{b}{a+b}$$
7. $\frac{3}{2x+1} + \frac{5}{3x-2}$

2.
$$\frac{x^{2} - 3x - 7}{x^{2} - 9} + \frac{x^{2} - 2x + 4}{x^{2} - 9}$$
3.
$$\frac{7}{3x - 6} - \frac{4}{3x - 6}$$
8.
$$\frac{3\alpha + 12}{2\alpha - 8} + \frac{\alpha - 6}{\alpha - 6}$$
4.
$$\frac{x^{2} + 2x + 2}{x^{2} - 4x + 4} - \frac{2x + 6}{x^{2} - 4x + 4}$$
9.
$$\frac{y + 1}{y} + \frac{y - 1}{y + 1}$$
5.
$$\frac{x - 2}{x - 4} - \frac{2}{x - 4}$$
10.
$$\frac{2x}{x^{2} - 4x + 4} - \frac{2x + 6}{x^{2} - 4x + 4}$$

8.
$$\frac{3a+12}{2a-8} + \frac{a+4}{a-4}$$

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

5. $\frac{x - 2}{x^2 - 4x} - \frac{2}{x^2 - 4x}$

10.
$$\frac{2x}{x^2 - 4x + 4} - \frac{1}{x - 2}$$