

# Adding and Subtracting Rational Expressions Assignment

Add or subtract the following rational expressions with the same denominator.

1.  $\frac{3}{a} + \frac{6}{a} - \frac{2}{a}$

2.  $\frac{4a}{a+b} + \frac{4b}{a+b}$

3.  $\frac{x+y}{3} - \frac{x-y}{3}$

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

5.  $\frac{6a}{2a+b} + \frac{3b}{2a+b}$

6.  $\frac{3z^2}{z^2+z} - \frac{2z^2+1}{z^2+z}$

7.  $\frac{5b+13}{3b^2} + \frac{b-4}{3b^2}$

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

9.  $\frac{3s+7}{s^2-9} + \frac{s+5}{s^2-9}$

10.  $\frac{5t-22}{t^2-5t+6} + \frac{4t-5}{t^2-5t+6}$

# Adding and Subtracting Rational Expressions Assignment

Add or subtract the rational expressions with different denominator.

11.  $\frac{4}{9w} - \frac{7}{6w}$

12.  $\frac{3v-1}{7v} - \frac{v-2}{14v}$

13.  $\frac{4}{5z} - \frac{1}{2z}$

14.  $\frac{4}{b} + \frac{4}{b+4}$

15.  $\frac{2}{x-2} - \frac{2}{x+3}$

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

17.  $\frac{4x}{x+y} - \frac{2x}{4x+4y}$

18.  $\frac{-5}{a^2-4} - \frac{2}{2a+4}$

19.  $\frac{-2}{2x-6} - \frac{3}{x-3}$

20.  $\frac{k+3}{k-2} - \frac{2}{5}$

# Adding and Subtracting Rational Expressions Assignment

Answer:

Add or subtract the following rational expressions with the same denominator.

1.  $\frac{3}{a} + \frac{6}{a} - \frac{2}{a}$

Solution:

$$\frac{3}{a} + \frac{6}{a} - \frac{2}{a} = \frac{3+6-2}{a} = \frac{7}{a}$$

2.  $\frac{4a}{a+b} + \frac{4b}{a+b}$

Solution:

$$\frac{4a}{a+b} + \frac{4b}{a+b} = \frac{4a+4b}{a+b} = \frac{4(a+b)}{\cancel{a+b}} = 4$$

3.  $\frac{x+y}{3} - \frac{x-y}{3}$

Solution:

$$\frac{x+y}{3} - \frac{x-y}{3} = \frac{(x+y)(x-y)}{3} = \frac{x^2 - y^2}{3}$$

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

Solution:

$$\frac{p^2}{p-1} + \frac{-p}{p-1} = \frac{p^2 - p}{p-1} = \frac{p(\cancel{p-1})}{\cancel{p-1}} = p$$

5.  $\frac{6a}{2a+b} + \frac{3b}{2a+b}$

Solution:

$$\frac{6a}{2a+b} + \frac{3b}{2a+b} = \frac{6a+3b}{2a+b} = \frac{3(\cancel{2a+b})}{\cancel{2a+b}} = 3$$

6.  $\frac{3z^2}{z^2+z} - \frac{2z^2+1}{z^2+z}$

Solution:

$$\frac{3z^2}{z^2+z} - \frac{2z^2+1}{z^2+z} = \frac{3z^2 - 2z^2 + 1}{z^2+z} = \frac{z^2+1}{z^2+z}$$

7.  $\frac{5b+13}{3b^2} + \frac{b-4}{3b^2}$

Solution:

$$\begin{aligned} \frac{5b+13}{3b^2} + \frac{b-4}{3b^2} &= \frac{5b+13+b-4}{3b^2} = \frac{6b+9}{3b^2} \\ &= \frac{\cancel{3}(2b+3)}{\cancel{3}b^2} = \frac{2b+3}{b^2} \end{aligned}$$

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

Solution:

$$\begin{aligned} \frac{3x^2+1}{8x^3} - \frac{1-3x^2}{8x^3} &= \frac{3x^2+1-(1-3x^2)}{8x^3} \\ &= \frac{3x^2+1-1+3x^2}{8x^3} = \frac{6x^2}{8x^3} = \frac{2}{3x} \end{aligned}$$

9.  $\frac{3s+7}{s^2-9} + \frac{s+5}{s^2-9}$

Solution:

$$\begin{aligned} \frac{3s+7}{s^2-9} + \frac{s+5}{s^2-9} &= \frac{3s+7+s+5}{s^2-9} = \frac{4s+12}{s^2-9} \\ &= \frac{4(\cancel{s+3})}{(s-3)(\cancel{s+3})} = \frac{4}{s-3} \end{aligned}$$

10.  $\frac{5t-22}{t^2-5t+6} + \frac{4t-5}{t^2-5t+6}$

Solution:

$$\begin{aligned} \frac{5t-22}{t^2-5t+6} + \frac{4t-5}{t^2-5t+6} &= \frac{5t-22+4t-5}{t^2-5t+6} \\ &= \frac{9t-27}{t^2-5t+6} = \frac{9(\cancel{t-3})}{(t-\cancel{3})(t-2)} = \frac{9}{t-2} \end{aligned}$$

# Adding and Subtracting Rational Expressions Assignment

Add or subtract the rational expressions with different denominator.

11.  $\frac{4}{9w} - \frac{7}{6w}$

**Solution:**

**LCD:**  $18w$

$$\frac{4}{9w} - \frac{7}{6w} = \frac{4(3) - 7(2)}{18w} = \frac{12 - 14}{18w} = -\frac{2}{18w} = -\frac{1}{9w}$$

12.  $\frac{3v-1}{7v} - \frac{v-2}{14v}$

**Solution:**

**LCD:**  $14v$

$$\begin{aligned} \frac{3v-1}{7v} - \frac{v-2}{14v} &= \frac{(3v-1)(2) - (v-2)}{14v} \\ &= \frac{6v - 2 - v + 2}{14v} = \frac{5v}{14v} = \frac{5}{14} \end{aligned}$$

13.  $\frac{4}{5z} - \frac{1}{2z}$

**Solution:**

**LCD:**  $10z$

$$\frac{4}{5z} - \frac{1}{2z} = \frac{4(2) - 1(5)}{10z} = \frac{8 - 5}{10z} = \frac{3}{10z}$$

14.  $\frac{4}{b} + \frac{4}{b+4}$

**Solution:**

**LCD:**  $b(b+4) = b^2 + 4b$

$$\begin{aligned} \frac{4}{b} + \frac{4}{b+4} &= \frac{4(b+4) + 4(b)}{b^2 + 4b} = \frac{4b + 16 + 4b}{b^2 + 4b} \\ &= \frac{8b + 16}{b^2 + 4b} \end{aligned}$$

15.  $\frac{2}{x-2} - \frac{2}{x+3}$

**Solution:**

**LCD:**  $(x-2)(x+3) = x^2 + x - 6$

$$\begin{aligned} \frac{2}{x-2} - \frac{2}{x+3} &= \frac{2(x+3) - 2(x-2)}{x^2 + x - 6} \\ &= \frac{2x + 6 - 2x + 4}{x^2 + x - 6} = \frac{10}{x^2 + x - 6} \end{aligned}$$

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

**Solution:**

**LCD:**  $x^2 - 36$

$$\begin{aligned} \frac{4x}{x^2-36} + \frac{2}{x-6} &= \frac{4x + 2(x+6)}{x^2-36} = \frac{4x + 2x + 12}{x^2-36} \\ &= \frac{6x + 12}{x^2-36} \end{aligned}$$

17.  $\frac{4x}{x+y} - \frac{2x}{4x+4y}$

**Solution:**

**LCD:**  $4x+4y$

$$\begin{aligned} \frac{4x}{x+y} - \frac{2x}{4x+4y} &= \frac{4x(4) - 2x}{4x+4y} = \frac{16x - 2x}{4x+4y} \\ &= \frac{14x}{4(x+y)} = \frac{7x}{x+y} \end{aligned}$$

18.  $\frac{-5}{a^2-4} - \frac{2}{2a+4}$

**Solution:**

**LCD:**  $2(a^2-4) = 2a^2-8$

$$\begin{aligned} \frac{-5}{a^2-4} - \frac{2}{2a+4} &= \frac{-5(a-2) - 2(2)}{2a^2-8} = \frac{-5a + 10 - 4}{2a^2-8} \\ &= \frac{-5a + 6}{2a^2-8} \end{aligned}$$

19.  $\frac{-2}{2x-6} - \frac{3}{x-3}$

**Solution:**

**LCD:**  $2x-6$

$$\begin{aligned} \frac{-2}{2x-6} - \frac{3}{x-3} &= \frac{-2 - 3(2)}{2x-6} = \frac{-8}{2x-6} = \frac{-8}{2(x-3)} \\ &= -\frac{4}{x-3} \end{aligned}$$

20.  $\frac{k+3}{k-2} - \frac{2}{5}$

**Solution:**

**LCD:**  $5(k-2) = 5k-10$

$$\begin{aligned} \frac{k+3}{k-2} - \frac{2}{5} &= \frac{(k+3)(5) - 2(k-2)}{5k-10} \\ &= \frac{5k + 15 - 2k + 4}{5k-10} = \frac{7k + 19}{5k-10} \end{aligned}$$