



**PROBLEMS AND SOLUTIONS - RATIONAL EXPRESSIONS AND EQUATIONS**  
Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada  
Please Send Questions and Comments to [ingrid.stewart@csn.edu](mailto:ingrid.stewart@csn.edu). Thank you!

**Problem 1:**

Simplify  $\frac{a + b}{4a^2 + 4ab}$ .

Please note that you are asked to "simplify". This means that you have to reduce the rational expression to lowest term.

**Problem 2:**

Simplify  $\frac{x^2 - 8x + 16}{x^2 - 16}$ .

**Problem 3:**

Simplify  $\frac{6x^2 - 24}{3x + 6}$ .

**Problem 4:**

Simplify  $\frac{x - y}{y - x}$ .

**Problem 5:**

Simplify  $\frac{r}{r + r^2}$ .

**Problem 6:**

Simplify  $\frac{(x + 2)(x - 3)^2}{x^4 - 13x^2 + 36}$ .

**Problem 7:**

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

**Problem 8:**

Subtract  $\frac{x}{x-1} - \frac{6}{x+3}$ .

**Problem 9:**

Subtract  $\frac{3}{4a} - \frac{5}{a^2}$ .

**Problem 10:**

Add  $\frac{x}{x+3} + \frac{2x+4}{(x+2)(x+3)}$ .

**Problem 11:**

Subtract  $\frac{5}{x+4} - \frac{4}{x}$ .

**Problem 12:**

Multiply  $\frac{x+2}{x} \cdot \frac{x^2+3x}{x^2+5x+6}$ .

**Problem 13:**

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

**Problem 14:**

Write the compound fraction  $\frac{1}{\frac{1}{x} - \frac{1}{y}}$  as a simple fraction.

**Problem 15:**

Solve  $\frac{5}{x-2} - \frac{17-x}{2x-4} = 0$ .

**Problem 16:**

$$\text{Solve } \frac{5}{x+6} - \frac{3}{x} = 0$$

**Problem 17:**

$$\text{Solve } \frac{x^2 + x - 6}{x^2 - 8x + 12} = 0$$

**Problem 18:**

$$\text{Solve } \frac{2}{x+1} + \frac{3}{3x+3} = \frac{5}{3}$$

**SOLUTIONS**

You can find detailed solutions below the link for this problem set!

1. $\frac{1}{4a}$	2. $\frac{x-4}{x+4}$	3. $2(x-2) = 2x - 4$
4. -1	5. $\frac{1}{1+r}$	6. $\frac{x-3}{(x+3)(x-2)}$ or $\frac{x-3}{x^2+x-6}$
7. $\frac{7x-2}{x^2-4}$	8. $\frac{x^2-3x+6}{x^2+2x-3}$	9. $\frac{3a-20}{4a^2}$
10. $\frac{x+2}{x+3}$	11. $\frac{x-16}{x^2+4x}$	12. 1
13. $\frac{1}{x^2-3x+2}$	14. $\frac{xy}{y-x}$	15. 7
16. 9	17. -3	18. $\frac{4}{5}$