Adding and Subtracting Rational Expression

- Let's Add or Subtract Rational Expression with a Common Denominator
  - Example

$$\frac{2}{5} + \frac{1}{5}$$

$$= \frac{2+1}{5}$$

$$= \frac{3}{5}$$

- The same principles apply when adding or subtracting rational expressions
  - Steps

1. Add or subtract the numerators.
2. Place the sum or difference of the numerators found in step 1 over the common denominator.
3. Simplify the faction if possible

  - Example

$$\frac{5}{m+3} + \frac{2}{m+3}$$

$$= \frac{5+2}{m+3}$$

$$= \underline{\underline{\frac{7}{m+3}}}$$

- Simplify and give the answer in the simplest form.

1. $\frac{8}{n+5} + \frac{3}{n+5}$

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

3. $\frac{4x}{x+2y} + \frac{x+y}{x+2y}$

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

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

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

Answer key

- *Simplify and give the answer in the simplest form.*

1.

$$\frac{8}{n+5} + \frac{3}{n+5}$$

$$= \frac{8+3}{n+5}$$

$$= \frac{11}{n+5}$$

2.

$$\frac{6}{a+b} - \frac{4}{a+b}$$

$$= \frac{6-4}{a+b}$$

$$= \frac{2}{a+b}$$

3.

$$\frac{4x}{x+2y} + \frac{x+y}{x+2y}$$

$$= \frac{4x+x+y}{x+2y}$$

$$= \frac{5x+y}{x+2y}$$

4.

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

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

$$= \frac{2x}{2x+1}$$

5.

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

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

$$= \frac{5x+1}{5x+1} = 1$$

6.

$$\frac{3x+y}{x-3y} - \frac{2x+4y}{x-3y}$$

$$= \frac{3x+y-2x-4y}{x-3y}$$

$$= \frac{x-3y}{x-3y} = 1$$