



## Réduire au même dénominateur

**Exercice n°1 :** Simplifier les fractions suivantes.

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

**Exercice n°2 :** Simplifier les fractions suivantes.

|                                   |                                    |
|-----------------------------------|------------------------------------|
| $\frac{1}{x+1} + \frac{1}{x+2}$   | $\frac{3}{x+2} + \frac{2}{x+3}$    |
| $\frac{7}{3x+2} - \frac{4}{2x+5}$ | $\frac{-2}{4-3x} - \frac{4}{2-6x}$ |

**Exercice n°3 :** Simplifier les fractions suivantes.

|                                        |                                          |
|----------------------------------------|------------------------------------------|
| $\frac{3x+5}{x+7} + \frac{4x-2}{x-3}$  | $\frac{-2x+3}{2x-3} + \frac{3x+7}{4x+5}$ |
| $\frac{x-2}{4x+2} - \frac{4x-1}{3x-2}$ | $\frac{2x+5}{3x-1} - \frac{3x-2}{5x-3}$  |



## Correction

**Exercice n°1 :** Simplifier les fractions suivantes.

|                                                                                                                                                                                |                                                                                                                                                                                                   |                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\frac{1}{x+1} + 3$ $= \frac{1}{x+1} + \frac{3}{1}$ $= \frac{1}{x+1} + \frac{3(x+1)}{1(x+1)}$ $= \frac{1}{x+1} + \frac{3x+3}{x+1}$ $= \frac{1+3x+3}{x+1}$ $= \frac{3x+4}{x+1}$ | $\frac{1}{2x+3} + 5$ $= \frac{1}{2x+3} + \frac{5}{1}$ $= \frac{1}{2x+3} + \frac{5(2x+3)}{1(2x+3)}$ $= \frac{1}{2x+3} + \frac{10x+15}{2x+3}$ $= \frac{1+10x+15}{2x+3}$ $= \frac{10x+16}{2x+3}$     | $\frac{1}{3x-2} + 4$ $= \frac{1}{3x-2} + \frac{4}{1}$ $= \frac{1}{3x-2} + \frac{4(3x-2)}{1(3x-2)}$ $= \frac{1}{3x-2} + \frac{12x-8}{3x-2}$ $= \frac{1+12x-8}{3x-2}$ $= \frac{12x-7}{3x-2}$ |
| $2 - \frac{1}{1-x}$ $= \frac{2(1-x)}{1-x} - \frac{1}{1-x}$ $= \frac{2-2x}{1-x} - \frac{1}{1-x}$ $= \frac{2-2x-1}{1-x}$ $= \frac{1-2x}{1-x}$                                    | $-1 - \frac{3x+2}{5x+3}$ $= \frac{-(5x+3)}{5x+3} - \frac{3x+2}{5x+3}$ $= \frac{-5x-3}{5x+3} - \frac{3x+2}{5x+3}$ $= \frac{-5x-3-(3x+2)}{5x+3}$ $= \frac{-5x-3-3x-2}{5x+3}$ $= \frac{-8x-5}{5x+3}$ | $\frac{3}{5} + \frac{2}{3x+1}$ $= \frac{3(3x+1)}{5(3x+1)} + \frac{5 \times 2}{5(3x+1)}$ $= \frac{9x+3}{15x+5} + \frac{10}{15x+5}$ $= \frac{9x+3+10}{15x+5}$ $= \frac{9x+13}{15x+5}$        |

**Exercice n°2 :** Simplifier les fractions suivantes.

|                                                                                                                                               |                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| $\frac{1}{x+1} + \frac{1}{x+2}$ $= \frac{1(x+2)}{(x+1)(x+2)} + \frac{1(x+1)}{(x+2)(x+1)}$ $= \frac{x+2}{(x+1)(x+2)} + \frac{x+1}{(x+2)(x+1)}$ | $\frac{3}{x+2} + \frac{2}{x+3}$ $= \frac{3(x+3)}{(x+2)(x+3)} + \frac{2(x+2)}{(x+3)(x+2)}$ $= \frac{3x+9}{(x+2)(x+3)} + \frac{2x+4}{(x+3)(x+2)}$ |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|

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

$$\begin{aligned}
 &= \frac{3x+9+(2x+4)}{(x+2)(x+3)} \\
 &= \frac{3x+9+2x+4}{(x+2)(x+3)} \\
 &= \frac{5x+13}{(x+2)(x+3)}
 \end{aligned}$$

$$\begin{aligned}
 &\frac{7}{3x+2} - \frac{4}{2x+5} \\
 &= \frac{7(2x+5)}{(3x+2)(2x+5)} - \frac{4(3x+2)}{(2x+5)(3x-12)} \\
 &= \frac{14x+35}{(3x+2)(7x+5)} - \frac{12x+8}{(2x+5)(3x+2)} \\
 &= \frac{14x+35-(12x+8)}{(3x+2)(2x+5)} \\
 &= \frac{14x+35-12x-8}{(3x+2)(2x+5)} \\
 &= \frac{2x+27}{(3x+2)(2x+5)}
 \end{aligned}$$

$$\begin{aligned}
 &\frac{-2}{4-3x} - \frac{4}{2-6x} \\
 &= \frac{-2(2-6x)}{(4-3x)(2-6x)} - \frac{4(4-3x)}{(2-6x)(4-3x)} \\
 &= \frac{-4+12x}{(4-3x)(2-6x)} - \frac{16-12x}{(2-6x)(4-3x)} \\
 &= \frac{-4+12x-(16-12x)}{(4-3x)(2-6x)} \\
 &= \frac{-4+12x-16+12x}{(4-3x)(2-6x)} \\
 &= \frac{24x-20}{(4-3x)(2-6x)} \\
 &= \frac{2(12x-10)}{2(4-3x)(1-3x)} \\
 &= \frac{12x-10}{(4-3x)(1-3x)}
 \end{aligned}$$

**Exercice n°3 :** Simplifier les fractions suivantes.

$$\begin{aligned}
 &\frac{3x+5}{x+7} + \frac{4x-2}{x-3} \\
 &= \frac{(3x+5)(x-3)}{(x+7)(x-3)} + \frac{(4x-2)(x+7)}{(x-3)(x+7)} \\
 &= \frac{3x^2-9x+5x-15}{(x+7)(x-3)} + \frac{4x^2+28x-2x-14}{(x-3)(x+7)} \\
 &= \frac{3x^2-4x-15}{(x+7)(x-3)} + \frac{4x^2+26x-14}{(x-3)(x+7)} \\
 &= \frac{3x^2-4x-15+(4x^2+26x-14)}{(x-3)(x+7)} \\
 &= \frac{3x^2-4x-15+4x^2+26x-14}{(x-3)(x+7)}
 \end{aligned}$$

$$\begin{aligned}
 &\frac{-2x+3}{2x-3} + \frac{3x+7}{4x+5} \\
 &= \frac{(-2x+3)(4x+5)}{(2x-3)(4x+5)} + \frac{(3x+7)(2x-3)}{(2x-3)(4x+5)} \\
 &= \frac{-8x^2-10x+12x+15}{(2x-3)(4x+5)} \\
 &\quad + \frac{6x^2-9x+14x-21}{(2x-3)(4x+5)} \\
 &= \frac{-8x^2+2x+15}{(2x-3)(4x+5)} + \frac{6x^2+5x-21}{(2x-3)(4x+5)} \\
 &= \frac{-8x^2+2x+15+(6x^2+5x-21)}{(2x-3)(4x+5)}
 \end{aligned}$$

$$= \frac{7x^2 + 22x - 29}{(x - 3)(x + 7)}$$

$$= \frac{-8x^2 + 2x + 15 + 6x^2 + 5x - 21}{(2x - 3)(4x + 5)}$$

$$= \frac{-2x^2 + 7x - 6}{(2x - 3)(4x + 5)}$$

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

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

$$= \frac{(x - 2)(3x - 2)}{(4x + 2)(3x - 2)} - \frac{(4x - 1)(4x + 2)}{(4x + 2)(3x - 2)}$$

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

$$= \frac{3x^2 - 2x - 6x + 4}{(4x + 2)(3x - 2)} - \frac{16x^2 + 8x - 4x - 2}{(4x + 2)(3x - 2)}$$

$$= \frac{10x^2 - 6x + 25x - 15}{(3x - 1)(5x - 3)} - \frac{9x^2 - 3x - 6x + 2}{(3x - 1)(5x - 3)}$$

$$= \frac{3x^2 - 8x + 4}{(4x + 2)(3x - 2)} - \frac{16x^2 + 4x - 2}{(4x + 2)(3x - 2)}$$

$$= \frac{10x^2 + 19x - 15}{(3x - 1)(5x - 3)} - \frac{9x^2 - 9x + 2}{(3x - 1)(5x - 3)}$$

$$= \frac{3x^2 - 8x + 4 - (16x^2 + 4x - 2)}{(4x + 2)(3x - 2)}$$

$$= \frac{10x^2 + 19x - 15 - (9x^2 - 9x + 2)}{(3x - 1)(5x - 3)}$$

$$= \frac{3x^2 - 8x + 4 - 16x^2 - 4x + 2}{(4x + 2)(3x - 2)}$$

$$= \frac{10x^2 + 19x - 15 - 9x^2 + 9x - 2}{(3x - 1)(5x - 3)}$$

$$= \frac{-13x^2 - 12x + 6}{(4x + 2)(3x - 2)}$$

$$= \frac{x^2 + 28x - 17}{(3x - 1)(5x - 3)}$$