

Simplifier une expression rationnelle.

$\frac{P}{Q}$ où P, Q sont des polynômes.

Ex :

$$\begin{aligned}\frac{x^3 + 3x^2 + 2x}{x^2 + 9x + 8} &= \frac{x(x^2 + 3x + 2)}{x^2 + 9x + 8} \\ &= \frac{x(\cancel{x+1})(x+2)}{(\cancel{x+1})(x+8)} \\ &= \frac{x(x+2)}{x+8}\end{aligned}$$

Ex :

$$\begin{aligned}\frac{2(x-2)(x^3+8)}{(-2x+5)(x^2-4)} &= \frac{2(x-2)(\cancel{x+2})(\cancel{x^2-2x+4})}{(-2x+5)(\cancel{x-2})(\cancel{x+2})} \\ &= \frac{2(x^2-2x+4)}{(-2x+5)}\end{aligned}$$

Simplifier $\frac{P}{Q} = \left(\begin{array}{l} \text{Factoriser } P + \text{Factoriser } Q \\ + \text{simplifier.} \end{array} \right)$

* Résoudre : $x^2 + 3x + 2 = 0$

$$\Delta = 3^2 - 4(2) = 9 - 8 = 1 \quad \left\{ \begin{array}{l} x_1 = \frac{-3+1}{2} = -1 \\ x_2 = \frac{-3-1}{2} = -2 \end{array} \right.$$

► Résoudre : $x^2 + 9x + 8 = 0$

$$\Delta = 9^2 - 4(1)(8) = 81 - 32 = 49 = 7^2 \quad \left\{ \begin{array}{l} x_1 = \frac{-9+7}{2} = -1 \\ x_2 = \frac{-9-7}{2} = -8 \end{array} \right.$$

$$A^2 - B^2 = (A-B)(A+B)$$

$$A^2 - 2AB + B^2 = (A-B)^2$$

$$A^2 + 2AB + B^2 = (A+B)^2$$

$$A^3 - B^3 = (A-B)(A^2 + AB + B^2)$$

$$A^3 + B^3 = (A+B)(A^2 - AB + B^2)$$

* Résoudre : $x^2 - 2x + 4 = 0$; $\Delta = 4 - 4(4) = -12 < 0$
pas de solution.