



Mathématiques

MAT-4106-1

Factorisation et fractions algébriques

ÉVALUATION FORMATIVE

Version A

Corrigé

Test de rendement

MAT-4106-1 FACTORISATION ET FRACTIONS ALGÈBRIQUES**CORRIGÉ - TEST DE RENDEMENT**

1.
 - a) $b(2a + 4c - 3d)$
 - b) $2c^2(a - 2c + 3)$
 - c) $5x(x + 9y - 3)$
 - d) $3z(x + y - 2zy)$
 - e) $-2a(a^2 + 9a - 6)$

2.
 - a) $(3x + 7y)(2a - 3b)$
 - b) $(x - 6)(2a + 3)$
 - c) $(3x - 3y)(x + 3) \Rightarrow 3(x - y)(x + 3)$

3.
 - a) $2(5a^2 + 12a - 9) \Rightarrow 2(5a - 3)(a + 3)$
 - b) $(x - 5)(x + 2)$
 - c) $(y + 3x)(y - 2x)$
 - d) $(2b + 9)(b - 1)$
 - e) $(y - 5)(y + 6)$
 - f) $(3x + 2y)(x - 4y)$

4.
 - a) $(11x - 3y)(11x + 3y)$
 - b) $(a^3 - b^3)(a^3 + b^3)$
 - c) $4(2xy - 3z^2)(2x + 3z^2)$
 - d) $(5c^5 - 2d^4)(5c^5 + 2d^4)$
 - e) $(c^2 - b^2)(c^2 + b^2) \Rightarrow (c + b)(c - b)(c^2 + b^2)$

5. a) $2x^2(y - x^2)(3x + y)$
- b) $3a(a - 3b)(a + 3b)$
- c) $5c(c^2 - c - 6) \Rightarrow 5c(c - 3)(c + 2)$
- d) $4(3x^2 + 18x + 2xy + 12y - x - 6)$
 \Downarrow
 $4(x + 6)(3x + 2y - 1)$
- e) $3y(8z^2 + 14z + 5) \Rightarrow 3y(4z + 5)(2z + 1)$
6. a) $\frac{(2x + 5)(x + 1)}{4(x + y)(2x + 5)} = \frac{x + 1}{4(x + y)}$
- b) $\frac{(r + s)(r - s)}{(2r + 3s)(r + s)} = \frac{r - s}{2r + 3s}$
- c) $\frac{3a(2b + a)(b - 2a)}{6a(2a - b)} = \frac{-(2b + a)}{2}$
7. a) $\frac{(5c + 2)(2a - 3b)}{4a^2} \times \frac{8a^2}{(5c + 2)(c + 1)} = \frac{2(2a - 3b)}{(c + 1)}$
- b) $\frac{(a + 2)(a - 2)}{(a + 2)(a + 3)} \times \frac{2}{2a(a - 2)} = \frac{1}{a(a + 3)}$
- c) $\frac{x + 3}{x + 8} - \frac{x + 1}{x + 6} = \frac{(x + 3)(x + 6) - (x + 1)(x + 8)}{(x + 8)(x + 6)}$
 $\frac{x^2 + 3x + 6x + 18 - x^2 - 8x - x - 8}{(x + 8)(x + 6)} = \frac{10}{(x + 8)(x + 6)}$
- d) $\frac{2}{6x - 4} + \frac{1}{3x + 2} = \frac{2}{2(3x - 2)} + \frac{1}{3x + 2} =$
 $\frac{1}{3x - 2} + \frac{1}{3x + 2} = \frac{3x + 2 + 3x - 2}{(3x - 2)(3x + 2)} = \frac{6x}{(3x - 2)(3x + 2)}$
- e) $\frac{a}{a + 1} + \frac{1}{a^2 - 1} = \frac{a}{a + 1} + \frac{1}{(a + 1)(a - 1)} =$
 $\frac{a(a - 1) + 1}{(a + 1)(a - 1)} = \frac{a^2 - a + 1}{(a + 1)(a - 1)}$

(suite 7)

$$\begin{aligned}
 \text{f)} \quad & \frac{10x}{5x^2 + 25x} - \frac{(x^2 + 12x + 35)}{x^2 + 14x + 49} = \\
 & \frac{10x}{5x(x+5)} - \frac{(x+5)(x+7)}{(x+7)(x+7)} \\
 & \frac{2}{(x+5)} - \frac{(x+5)}{(x+7)} = \frac{2(x+7) - (x+5)(x+5)}{(x+5)(x+7)} \\
 & \frac{2x + 14 - x^2 - 10x - 25}{(x+5)(x+7)} = \frac{-x^2 - 8x - 11}{(x+5)(x+7)}
 \end{aligned}$$

$$\begin{aligned}
 \text{g)} \quad & \frac{1}{a+3} + \frac{2(5a-2)(a-3)}{(3+a)(3-a)} = \frac{1}{a+3} - \frac{2(5a-2)}{a+3} \\
 & \frac{1 - 10a + 4}{a+3} = \frac{-10a + 5}{a+3} \quad \text{ou} \quad \frac{-5(2a+1)}{a+3}
 \end{aligned}$$

8. Démontrer:

$$\begin{aligned}
 \text{a)} \quad & \frac{3a^2 + 22a + 24}{a^2 + 12a + 36} - \frac{1}{a+6} = \frac{(3a+4)(a+6)}{(a+6)(a+6)} - \frac{1}{(a+6)} \\
 & = \frac{3a+4}{a+6} - \frac{1}{a+6} = \frac{3a+4-1}{a+6} = \frac{3a+3}{a+6} = \frac{3(a+1)}{a+6}
 \end{aligned}$$

Démontrer:

$$\begin{aligned}
 \text{b)} \quad & \frac{-(x-1)(x-1)}{(1-x)(1+x)} + \frac{1}{x+1} = \frac{x-1}{1+x} + \frac{1}{x+1} = \\
 & \frac{x-1+1}{1+x} = \frac{x}{1+x} \quad \text{C.Q.F.D.}
 \end{aligned}$$

Démontrer

$$\begin{aligned}
 \text{c)} \quad & \frac{3a+6}{3a^2+24a+36} - \frac{a}{a^2+9a+18} = \frac{1}{a+3} - \frac{a+4}{a^2+10a+24} \\
 & \frac{3(a+2)}{3(a+2)(a+6)} - \frac{a}{(a+3)(a+6)} = \frac{1}{a+3} - \frac{(a+4)}{(a+4)(a+6)} \\
 & \frac{1}{a+3} - \frac{a}{(a+3)(a+6)} = \frac{1}{a+3} - \frac{1}{a+6}
 \end{aligned}$$

(suite 8c)

$$\frac{a + 3 - a}{(a + 3)(a + 6)} = \frac{a + 6 - (a + 3)}{(a + 3)(a + 6)}$$

$$\frac{3}{(a + 3)(a + 6)} = \frac{a + 6 - a - 3}{(a + 3)(a + 6)}$$

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