Enoncé

$$f(x) = -x^3 + 2x^2 - x + \sqrt{2}$$

$D_f = \mathbb{R}$

Correction

$$f'(x) = -3x^2 + 4x - 1$$

Enoncé

$$f(x) = x + \frac{1}{3} + \frac{1}{x}$$

$D_f = \mathbb{R}^*$

Correction

$$f'(x) = 1 - \frac{1}{x^2}$$

Enoncé

$$f(x) = -x + (1-x)(3-x) \qquad D_f = \mathbb{R}$$

Correction

$$(1-x)(3-x) \text{ est sous la forme } \boldsymbol{u} \cdot \boldsymbol{v} \text{ avec :}$$

- $u = 1 - x \implies u' = -1$
- $v = 3 - x \implies v' = -1$

$$\text{on applique la formule : } \boldsymbol{u}' \cdot \boldsymbol{v} + \boldsymbol{u} \cdot \boldsymbol{v}'$$

$$f'(x) = -1 + [(-1) \cdot (3-x) + (1-x) \cdot (-1)]$$

$$\implies f'(x) = -1 + [-3 + x + (-1) + x]$$

$$\implies f'(x) = -1 + (-4) + 2x$$

$$\implies f'(x) = 2x - 5$$

Enoncé

$$f(x) = \frac{3x-5}{2-7x} \qquad D_f = \mathbb{R}\backslash\left\{\frac{2}{7}\right\}$$

Correction

$$f \text{ est sous la forme } \frac{\boldsymbol{u}}{\boldsymbol{v}} \text{ avec :}$$

- $u = 3x - 5 \implies u' = 3$
- $v = 2 - 7x \implies v' = -7$

$$\text{on applique la formule : } \frac{\boldsymbol{u'\cdot v - u\cdot v'}}{\boldsymbol{v^2}}$$

$$f'(x) = \frac{3\cdot(2-7x)-(3x-5)\cdot(-7)}{(2-7x)^2}$$

$$\implies f'(x) = \frac{6-21x+21x-35}{(2-7x)^2}$$

$$\implies f'(x) = \frac{6-35}{(2-7x)^2}$$

$$\implies f'(x) = \frac{-29}{(2-7x)^2}$$

Enoncé

$$f(x) = \frac{2x}{x^2 - 4} \qquad D_f = \mathbb{R}\backslash\{-2;2\}$$

Correction

$$f \text{ est sous la forme } \frac{\boldsymbol{u}}{\boldsymbol{v}} \text{ avec :}$$

- $u = 2x \implies u' = 2$
- $v = x^2 - 4 \implies v' = 2x$

$$\text{on applique la formule : } \frac{\boldsymbol{u' \cdot v - u \cdot v'}}{\boldsymbol{v^2}}$$

$$f'(x) = \frac{2 \cdot (x^2 - 4\,) - 2x \cdot 2x}{(x^2 - 4)^2}$$

$$\implies f'(x) = \frac{2x^2 - 8 - 4x^2}{(x^2 - 4)^2}$$

$$\implies f'(x) = \frac{-2x^2 - 8}{(x^2 - 4)^2}$$

Enoncé

$$f(x) = \frac{1}{x^2 + x + 2} \qquad D_f = \mathbb{R}$$

Correction

$$f \text{ est sous la forme } \frac{\mathbf{1}}{\boldsymbol{u}} \text{ avec :}$$

- $u = x^2 + x + 2 \implies u' = 2x + 1$

$$\text{on applique la formule : } \frac{-\boldsymbol{u}'}{\boldsymbol{u}^2}$$

$$f'(x) = \frac{-(2x+1)}{(x^2+x+2)^2}$$

$$\implies f'(x) = \frac{-2x-1}{(x^2+x+2)^2}$$

Enoncé

$$f(x) = \frac{x^2 - 5x + 3}{x - 3} \qquad D_f = \mathbb{R}\backslash\{3\}$$

Correction

$$f \text{ est sous la forme } \frac{\boldsymbol{u}}{\boldsymbol{v}} \text{ avec :}$$

- $u = x^2 - 5x + 3 \implies u' = 2x - 5$
- $v = x - 3 \implies v' = 1$

$$\text{on applique la formule : } \frac{\boldsymbol{u' \cdot v - u \cdot v'}}{\boldsymbol{v^2}}$$

$$f'(x) = \frac{(2x - 5) \cdot (x - 3) - (x^2 - 5x + 3)}{(x - 3)^2}$$

$$\implies f'(x) = \frac{2x^2 - 6x - 5x + 15 - x^2 + 5x - 3}{(x - 3)^2}$$

$$\implies f'(x) = \frac{x^2 - 6x + 12}{(x - 3)^2}$$

Enoncé

$$f(x) = (3x+2)^2 \qquad D_f = \mathbb{R}$$

Correction

$$f \text{ est sous la forme } \boldsymbol{u^n} \text{ avec :}$$

- $u = 3x + 2 \implies u' = 3$

$$on\ applique\ la\ formule : \boldsymbol{nu'u^{n-1}}$$

$$f'(x) = 2 \cdot 3 \cdot (3x+2)^1$$

$$\implies f'(x) = 6 \cdot (3x+2)$$

$$\implies f'(x) = 18x + 12$$

Enoncé

$$f(x) = \frac{x^2 - x + 1}{1 - 2x} \qquad D_f = \mathbb{R}\backslash\left\{\frac{1}{2}\right\}$$

Correction

$$f \text{ est sous la forme } \frac{\boldsymbol{u}}{\boldsymbol{v}} \text{ avec :}$$

- $u = x^2 - x + 1 \implies u' = 2x - 1$
- $v = 1 - 2x \implies v' = -2$

$$\text{on applique la formule : } \frac{\boldsymbol{u' \cdot v - u \cdot v'}}{\boldsymbol{v^2}}$$

$$f'(x) = \frac{(2x-1) \cdot (1-2x) - (x^2 - x + 1) \cdot (-2)}{(1-2x)^2}$$

$$\implies f'(x) = \frac{2x - 1 - 4x^2 + 2x + 2x^2 - 2x + 2}{(1-2x)^2}$$

$$\implies f'(x) = \frac{-2x^2 + 2x + 1}{(1-2x)^2}$$