

4Exercice 38p117

1. Forme $u \times v$

$$f'(x) = 2x\sqrt{x} + (x^2 + 2) \times \frac{1}{2\sqrt{x}} = \frac{2x\sqrt{x} \times 2\sqrt{x} + x^2 + 2}{2\sqrt{x}} = \frac{5x^2 + 2}{2\sqrt{x}}$$

2. Forme $\frac{1}{u}$

$$f'(t) = \frac{-4t}{(2t^2 + 4)^2}$$

3. Forme $4 \times \frac{1}{u}$

$$f'(x) = 4 \times \frac{-6x^2 - 2x}{(2x^3 - x^2)^2} = \frac{-24x^2 - 8x}{(2x^3 - x^2)^2}$$

4. Forme $\frac{u}{v}$

$$\begin{aligned} f'(x) &= \frac{4(3x^2 + 2x + 1) - (4x + 1) \times (6x + 2)}{(3x^2 + 2x + 1)^2} \\ &= \frac{12x^2 + 8x + 4 - 24x^2 - 8x - 6x - 2}{(3x^2 + 2x + 1)^2} = \frac{-12x^2 - 6x + 2}{(3x^2 + 2x + 1)^2} \end{aligned}$$

Exercice 41 p116

1. Forme $u \times v$

$$\begin{aligned} u(t) &= 2t & u'(t) &= 2 \\ v(t) &= (t + 1)^{10} & v'(t) &= 10(t + 1)^9 \end{aligned}$$

v est de la forme $g(at + b)$ avec $g(t) = t^{10}$ et $a = 1$

$$\begin{aligned} f'(t) &= 2t \times (10(t + 1)^9) + 2 \times (t + 1)^{10} \\ &= (t + 1)^9(20t + 2(t + 1)) \\ &= (t + 1)^9(22t + 2) \end{aligned}$$

2. Forme $u \times v$

$$\begin{aligned} u(x) &= x + 1 & u'(x) &= 1 \\ v(x) &= \sqrt{3x + 1} & v'(x) &= 3 \times \frac{1}{2\sqrt{3x + 1}} \end{aligned}$$

v est de la forme $g(ax + b)$ avec $g(x) = \sqrt{x}$ et $a = 3$

$$f'(x) = 1 \times \sqrt{3x + 1} + \frac{3x + 3}{2\sqrt{3x + 1}} = \frac{2 \times (3x + 1) + 3x + 3}{2\sqrt{3x + 1}} = \frac{9x + 5}{2\sqrt{3x + 1}}$$

3. Forme $6 \times \frac{1}{u}$

$$\text{Avec } u(x) = (2x - 4)^{10} \quad \text{donc } u'(x) = 10 \times 2 \times (2x - 4)^9 = 20(2x - 4)^9$$

$$\text{Donc } f'(x) = 6 \times \frac{-20(2x - 4)^9}{(2x - 4)^{20}} = \frac{-120}{(2x - 4)^{11}}$$

4. Forme $\frac{u}{v}$

avec $u(x) = \sqrt{6-2x}$ d'où $u'(x) = \frac{-2}{2\sqrt{6-2x}} = \frac{-1}{\sqrt{6-2x}}$

5.

$v(x) = x$ d'où $v'(x) = 1$

$$\begin{aligned} f'(x) &= \frac{\frac{-1}{\sqrt{6-2x}} \times x - \sqrt{6-2x} \times 1}{x^2} \\ &= \frac{-x - (6-2x)}{x^2\sqrt{6-2x}} \\ &= \frac{x-6}{x^2\sqrt{6-2x}} \end{aligned}$$