1) f(x) = $(x^2+1)\sqrt{x}$

forme $u\times v$ avec u = x^2+1 v = $\sqrt{x}$

u' = 2x v' = $\frac{1}{2\sqrt{x}}$

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

$= 2x\sqrt{x}+\frac{x^2+1}{2\sqrt{x}}$

$= \frac{2x\sqrt{x}\times 2\sqrt{x}+x^2+1}{2\sqrt{x}}$

$= \frac{5x^2+1}{2\sqrt{x}}$

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

forme u/v avec u = $4x-2$ v = $2x^2+3x$

u' = 4 v' = 4x+3

$f'(x) = \frac{4(2x^2+3x)-(4x-2)(4x+3)}{(2x^2+3x)^2}$

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

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

forme u/v avec u = $3\sqrt{x}$ v = x+1

u' = $\frac{3}{2\sqrt{x}}$ v' = 1

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

$f'(x) = \frac{\frac{3x+3}{2\sqrt{x}}-3\sqrt{x}}{(x+1)^2}$

$f'(x) = \frac{-3x+3}{2\sqrt{x}(x+1)^2}$

4) f(x) = $2x+\frac{5x^2+2x}{x^2-1}$

On commence par $\frac{5x^2+2x}{x^2-1}$

forme u/v avec u = $5x^2+2x$ v = x^2-1

u' = $10x+2$ v' = 2x

$\left(\frac{5x^2+2x}{x^2-1}\right)' = \frac{(10x+2)(x^2-1)-(5x^2+2x)\times 2x}{(x^2-1)^2}$

$= \frac{-2x^2-10x-2}{(x^2-1)^2}$

on a donc $f'(x)$ = 2+ $\frac{-2x^2-10x-2}{(x^2-1)^2}$

$f'(x) = \frac{2(x^2-1)^2-2x^2-10x-2}{(x^2-1)^2}$

$f'(x) = \frac{2x^4-4x^2+2-2x^2-10x-2}{(x^2-1)^2}$

$f'(x) = \frac{2x^4-6x^2-10x}{(x^2-1)^2}$

5) f(x) = $4x^2+3x\sqrt{x}$

$x\sqrt{x}$ est de la forme $u\times v$ donc

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

$= \ldots = \frac{3x}{2\sqrt{x}}$ d'où $f'(x) = 8x+\frac{9x}{2\sqrt{x}}$

$= \frac{16x\sqrt{x}+9x}{2\sqrt{x}}$