ANALYSE : LES DERIVEES

Exercices de la série N°2 du syllabus

$(12)' = 0$

$(50x)' = 50$

$(x^4)' = 4x^3$

$(5x^8)' = 40x^7$

$(3x^{10} - 2x^9 + x^2 - x + 5)' = 30x^9 - 18x^8 + 2x - 1$

$((3x^3 - 4).(2x^2 - 5))' = (9x^2)(2x^2 - 5) + (3x^3 - 4)(4x) = 30x^4 - 45x^2 - 16x$

$((12x^6 + 3x^2 - x + 1)^4)' = 4(12x^6 + 3x^2 - x + 1)^3(72x^5 + 6x - 1)$

$$\left(\sqrt[11]{x^6}\right)' = \frac{6}{11\sqrt[11]{x^5}}$$

$((2x + 1)^2 . (3x^2 - 2)^3)' = 2(2x + 1)\,2(3x^2 - 2)^3 + (2x + 1)^2\,3(3x^2 - 2)^2\,6x$
$= 2(2x + 1)(3x^2 - 2)^2(24x^2 + 9x - 4)$

$$\left(\frac{-3x^5}{19}\right)' = \frac{-15x^4}{19}$$

$$\left(\frac{-9}{x^7}\right)' = \frac{63}{x^8}$$

$$\left(\frac{5}{\sqrt[7]{x^5}}\right)' = \frac{-25}{7x\sqrt[7]{x^5}}$$

$$\left(\frac{3x^2+10x-12}{-4x+1}\right)' = \frac{(6x+10)(-4x+1)-(3x^2+10x-12)(-4)}{(-4x+1)^2} = \frac{-12x^2+6x-38}{(-4x+1)^2} = \frac{2(-6x^2+3x-19)}{(-4x+1)^2}$$

$$\left(\sqrt{3x^2+10}\right)' = \frac{3x}{\sqrt{3x^2+10}}$$

$$\left(\frac{3x+5}{(x-2)^3}\right)' = \frac{3(x-2)^3-(3x+5)3(x-2)^2 1}{(x-2)^6} = \frac{3(x-2)^2((x-2)-(3x+5))}{(x-2)^6} = \frac{3(-2x-7)}{(x-2)^4}$$

$$\left(\frac{(4x+1)^5}{3x^3}\right)' = \frac{5(4x+1)^4 4(3x^3)-(4x+1)^5 9x^2}{27x^9} = \frac{3x^2(4x+1)^4(20x-12x-3)}{27x^9} = \frac{(4x+1)^4(20x-12x-3)}{9x^7}$$

$$\left(\frac{(5x^2+1)^6}{(2x^3+5)^5}\right)' = \frac{6(5x^2+1)^5 10x(2x^3+5)^5-(5x^2+1)^6 5(2x^3+5)^4 6x^2}{(2x^3+5)^{10}} = \frac{30x(5x^2+1)^5(2x^3+5)^4(2(2x^3+5)-(5x^2+1)x)}{(2x^3+5)^{10}}$$

$$= \frac{30x(5x^2+1)^5(-x^3-x+10)}{(2x^3+5)^6}$$

$(3 \cos 2x)' = 3 (-\sin 2x) 2 = -6 \sin 2x$

$(\cos 5x - \sin 2x)' = -5 \sin 5x – 2 \cos 2x$

$(\sin^2 x + \cos^3 x)' = 2 \sin x \cos x - 3 \cos^2 x \sin x$

$(\sin 3x \cos 4x)' = 3 \cos 3x \cos 4x – 4 \sin 3x \sin 4x$

$((\sin 3x)^2 tg2x)' = 2 \sin 3x \cos 3x\ 3\ tg\ 2x + \sin^2 3x \frac{1}{cos^2 2x} 2 = 3 \sin 6x\ tg2x + \frac{2}{cos^2 2x}$

$$((\frac{\sin 4x}{\cos 2x})' = \frac{4\cos 4x \cos 2x + 2\sin 4x \sin 2x}{\cos^2 2x} = \frac{2(2\cos 4x \cos 2x + \sin 4x \sin 2x)}{\cos^2 2x}$$

$$(\sqrt{\cos 2x})' = \frac{-2\sin 2x}{2\sqrt{\cos 2x}} = \frac{-\sin 2x}{\sqrt{\cos 2x}}$$

$$(tg\sqrt{x^2+1})' = \frac{1}{\cos^2\sqrt{x^2+1}} \frac{1}{2\sqrt{x^2+1}} 2x = \frac{x}{\sqrt{x^2+1}\cos^2\sqrt{x^2+1}}$$

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

$$(3\sin^2(5x - \frac{\pi}{3}))' = 6\sin(5x - \frac{\pi}{3})\cos(5x - \frac{\pi}{3})5 = 15\sin(10x - \frac{2\pi}{3})$$