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MATERIA: BIOMATEMATICAS

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ACTIVIDAD: DERIVADAS

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1- $f(x) = 3x^2 - x + 5$

$f'(x) = 6x - 1$

2 $g(t) = 1 - 3t^2 - 2t^4$

$g'(t) = -6t - 8t^3$

$U(x) \cdot V(x)$

3· $f(x) = (2x+3)(3x-2)$ $f'(x) = U'(x) \cdot V(x) + U(x) \cdot$

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

$$\overset{U}{} \quad \overset{V}{}$$

4 · $g(x) = (2x^2 - 1)(x^3 + 2)$ $\quad UV \quad f'(x) = U'(x)V(x$

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

5 · $h(x) = (x+1)^3$ $\quad f(x) = x^n \quad f'(x) = n \cdot x^{n-1}$

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

$h'(x) = 3(x+1)^2$

6 · $g(t) = (4t - 7)^2$

$g'(t) = 2(4t-7)(4)$

$g'(t) = 8(4t-7)$

7 · $f(v) = \overset{U}{y}\,\overset{V}{(2y-1)(2y+1)}$ $\quad \overset{UV}{f'(v) = U'(x)V(x) + U(x) \cdot V'(x)}$

$f(v) = (2y^2 - y)(2y^2 + y)$

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

8 · $f(x) = 4x^4 - \dfrac{1}{x^2} \dfrac{U}{V}$ $\quad \dfrac{U'(x)V(x) - U(x)V'(x)}{V^2}$

$f'(x) = 16x^3 - \dfrac{0(x^2) - 1(2x)}{(x^2)^2}$ $\quad f'(x) = 16x^3 - \left[\dfrac{-2x}{x^4}\right]$

$f'(x) = 16x^3 + \dfrac{2x}{x^4}$

9 · $g(x) = \dfrac{1}{x+1} \dfrac{U}{V} - \dfrac{1}{x-1} \dfrac{U}{V}$ $\quad \dfrac{U}{V}$ $\quad f'(x) = \dfrac{U'(x)V(x) - U(x)V'(}{V^2}$

$g'(x) = \dfrac{\cancel{0(x+1)} - 1(x)}{(x+1)^2} - \dfrac{\cancel{0(x+1)}(1)}{(x-1)^2}$

$g'(x) = \dfrac{-1}{(x+1)^2} + \dfrac{1}{(x-1)^2}$

$10.- f(t) = \frac{1}{4 - t^2}$ $\frac{u}{v} = \frac{u'v - uv'}{v^2}$ $v = 4 - t^2$

$v' = -2t$

$f'(t) = \frac{\cancel{(0)(4-t^2)} - (1)(0 - 2t)}{(4-t^2)^2}$

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

$11.- h(x) = \frac{3}{x^2 + x + 1}$ $\frac{u}{v} = \frac{u'v - uv'}{v^2}$

$h'(x) = \frac{\cancel{(0)(x^2+x+1)} - (3)(2x+1+0)}{(x^2+x+1)^2}$

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

$12.- f(x) = \frac{4}{1 - \frac{2}{x}}$ $\frac{u}{v}$ $\frac{u'v - uv'}{1-2v^2}$

$f'(x) = \frac{\cancel{(0)\left(1 - \frac{2}{x}\right)} - (0)\left[(0) - \frac{\cancel{(0)(x)} - (2)(1)}{(x)^2}\right]}{\left(1 - \frac{2}{x}\right)}$

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

$13.- \; g(t) = (\overbrace{t^2+1}^{U})(\overbrace{t^3+t^2+1}^{V}) \quad UV = U'V + UV'$

$V' = 3t^2+2t+0 \quad U = t^2+1 \quad U' = 2t+0$

$g'(t) = (2t+0)(t^3+t^2+1)+(t^2+1)(3t^2+2t+0)$

$g'(t) = (2t)(t^3+t^2+1)+(t^2+1)(3t^2+2t)$

$14.- \; f(x) = (2x^3-3)(17x^4-6x+2) \quad UV = U'V + UV'$

$V' = 68x^3-6x \quad U = 2x^3-3 \quad U' = 6x^2$

$f'(x) = (6x^2)(17x^4-6x+2)+(2x^3-3)(68x^3-6x)$

15. $g(z) = \frac{1}{2z} - \frac{1}{3z^2} \quad \frac{u}{v} = \frac{u'v - uv'}{v^2}$

$g'(z) = \frac{\cancel{(0)(2z)} - (1)(2)}{(3z^2)^2}$

$g'(z) = \frac{-2}{(3z)^4} - \frac{1}{(3z^2)} \rightarrow \frac{u}{v}$

$g'(z) = \frac{-\cancel{(0)(3z^2)} - (1)(6z)}{(3z^2)^2} = \frac{-6z}{(3z)^4}$

$g'(z) = \frac{-2}{(3z)^4} + \frac{6z}{(3z)^4}$

16 $f(x) = \frac{2x^3 - 3x^2 + 4x - 5}{x^2}$ $\frac{U}{V} = \frac{U'V - UV'}{V^2}$

$U = (2x^3 - 3x^2 + 4x - 5)$

$U' = (6x^2 - 6x + 4)$

$V = (x^2)$

$V' = (2x)$

$f'(x) = \frac{(6x^2 - 6x + 4)(x^2) - (2x^3 - 3x^2 + 4x - 5)(2x)}{(x^2)^2}$

$f'(x) = \frac{(6x^2 - 6x + 4)(x^2) - (2x^3 - 3x^2 + 4 - 5)(+2x)}{(x)^4}$

17.- $g(y) = 2y(3y^2 - 1)(y^2 + 2y + 3)$

$g'(y) = 2y(3y^4 - y^2 + 6y^3 - 2y + 9y^2 - 3)$

$g'(y) = (3y^4 + 6y^3 + 8y^2 - 2y - 3)$

$g'(y) = 6y^5 + 12y^4 + 16y^3 - 4y^2 - 6y$

18.. $f(x) = \frac{x^2-4}{x^2+4}$ $\frac{u}{v}$ $\frac{u'v - uv'}{v^2}$

$f'(x) = \frac{(2x-0)(x^2+4) - (x^2-4)(2x+0)}{(x^2+4)^2}$

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

$f'(x) = \frac{(x^2+4) - (x^2-4)}{(x2+4)^2}$

19.. $g(t) = \frac{t-1}{t^2+2t+1}$ $\frac{u}{v}$ $\frac{u'v - uv'}{v^2}$

$g'(t) = \frac{(1)(t^2+2t+1) - (t-1)(2t+2+0)}{(t^2+2t+1)^2}$

$g'(t) = \frac{(t^2+2t+1) - (2t+2)}{(t^2+2t+1)^2}$

20.. $u(x) = \frac{1}{(x+2)^2}$ $\frac{u}{v}$ $\frac{u'v - uv'}{v^2}$

$u'(x) = \frac{\cancel{(0)(x+2)^2} - (1)2(x+2)(1+0)}{(x+2)^2}$

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

21. $v(t) = \dfrac{1}{(t-1)^3} \rightarrow (t-1)^{-3}$

Regla de la cadena.

$v'(t) = -3(t-1)^{-4} \cdot (t-0)$

$v'(t) = -3(t-1)^{-4} \cdot (t)$

22. $h(x) = \dfrac{2x^3+x^2-3x+17}{2x-5}$ $\quad \dfrac{u}{v} = \dfrac{u'v - uv'}{v^2}$

$h'(x) = \dfrac{(6x^2+2x-3+0)(2x-5) - (2x^3+x^2-3x+17)(2)}{(2x-5)^2}$

$h'(x) = \dfrac{(6x^2+2x-3)(2x-5)-(2)(2x^3+x^2-3x+17)}{(2x-5)^2}$

23. $g(x) = \dfrac{3x}{x^3+7x-5}$ $\quad \dfrac{u}{v} = \dfrac{u'v - uv'}{v^2}$

$g'(x) = \dfrac{(3)(x^3+7x-5)-(x^3+7x-5)(3x^2+7-0)}{(x^3+7x-5)^2}$

$g'(x) = \dfrac{(3)(x^3+7x-5)-(x^3+7x-5)(3x^2+7)}{(x^3+7x-5)^2}$

24- $f(t) = \frac{1}{\left(t + \frac{1}{t}\right)^2} = \left(t + \frac{1}{t}\right)^{-2}$

$f'(t) = -2\left(t + \frac{1}{t}\right)^{-3} \cdot \left(1 + \frac{1}{t^2}\right)$

25.- $g(x) = \frac{\frac{1}{x} - \frac{2}{x^2}}{\frac{2}{x^3} - \frac{2}{x^4}} = \frac{\frac{x^2-2x}{x^3}}{\frac{2x^4-3x^3}{x^7}} = \frac{x^9 - 2x^8}{2x^7 - 3x^6}$

$\frac{U'V - UV'}{V^2}$

$U = x^9 - 2x^8$

$U' = 9x^8 - 16x^7$

$V = 2x^7 - 3x^6$

$V' = 14x^6 - 18x^5$

$g'(x) = \frac{(9x^8 - 16x^7)(2x^7 - 3x^6) - (x^9 - 2x^8)(14x^6 - 18x^5)}{(2x^7 - 3x^6)^2}$