Ejercicios de "Derivadas"

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2 "B"

1. $f(x) = 3x^2 - x + 5$
$f'(x) = 2 \cdot 3x^{2-1} - 1 + 0$
$f'(x) = 6x - 1$

2. $g(t) = 1 - 3t^2 - 2t^4$
$g'(t) = 0 - 2 \cdot 3t^{2-1} - 4 \cdot 2t^{4-3}$
$g'(x) = -6t - 8t^3$

3. $F(x) = \overbrace{(2x+3)}^{u}\overbrace{(3x-2)}^{v}$ $\quad u' \cdot v + u \cdot v'$
$f'(x) = (2+0) \cdot (3x-2) + (2x+3) \cdot (3-0)$
$F'(x) = (2) \cdot (3x-2) + (2x+3) \cdot (3)$

4. $g(x) = (2x^2-1)(x^3+2)$ $\quad u' \cdot v + u \cdot v'$
$g'(x) = (2 \cdot 2x^{2-1})(x^3+2) + (2x^2-1) \cdot (3x^{3-1}+0)$
$g'(x) = (4x) \cdot (x^3+2) + (2x^2-1)(3x^2)$

5. $h(x) = (x+1)^3$ $\quad n \cdot x^{n-1}$
$h'(x) = 3 \cdot (x+1)^{3-1} \cdot (1+0)$
$h'(x) = 3(x+1)^2 \cdot (1)$
$h'(x) = 3(x+1)^2$

6. $g(t) = (4t-7)^2$ $\quad n \cdot x^{n-1}$
$g'(t) = 2(4t-7)^{2-1} \cdot (4-0)$
$g'(t) = 2(4t-7) \cdot (4)$

7. $f(y) = 4(2y-1)(2y+1)$ $\quad u' \cdot v + u \cdot v'$
$f'(y) = (2y^2-y)(2y^2+y)$
$F'(y) = (2 \cdot 2y^{2-1} - 1) \cdot (2y^2+y) + (2y^2-y) \cdot (2 \cdot 2y^{2-1}+1)$
$F'(y) = (4y-1)(2y^2+y) + 2y^2 - y(4y+1)$

8. $f(x) = 4x^4 - \frac{1}{x^2}$

$f'(x) = 4 \cdot 4x^{4-1} - \frac{0(x^2) - 1(2x^{2-1})}{[x^2]^2}$

$f'(x) = 16x^3 - \left[\frac{-2x}{x^2}\right]$

$f'(x) = 16x3 + \frac{2x}{x^4}$

$\frac{u' \cdot v + u \cdot v'}{v^2}$

9. $g(x) = \frac{1}{x+1} - \frac{1}{x-1}$

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

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

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

$\frac{u' \cdot v + u \cdot v'}{v^2}$

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

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

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

11. $h(x) = \dfrac{3}{x^2+x+1}$ $\dfrac{U' \cdot U + U \cdot V'}{V^2}$

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

$h'(x) = \dfrac{-6x-3}{(x^2+x+1)^2}$

12. $f(x) = \dfrac{1}{1-\frac{2}{x}}$ $\dfrac{U' \cdot U + U \cdot U'}{V^2}$

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

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

13. $g(t) = (t^2+1)(t^3+t^2+1)$.

13. $g(t)=(t^2+1)(t^3+1^2+1)$ $\quad (u'.v+u.v')$

$g'(t)=(2t^{2-1}+1).(t^3+1^2+1)+(t^2+1).(3t^{3-1}+2.1^{2-1}+0)$

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

14. $f(x)=(2x3-3)(17x^4-6x+2)$ $\quad (u'.v+u.v')$

$f'(x)=(3.2^2-0).(17x^4-6x+2)+(2x^3-3).(4.17^3-6+0)$

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

15. $g(z)=\frac{1u}{2z\,v}-\frac{1u}{3z3v}$ $\quad \frac{u'.v-u.v'}{v^2}$

$g'(z)=\frac{0.2z-1.2}{(2z)^2}-\frac{0.3z^2-1.3.3z}{(3z^3)^2}$

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

16. $f'(x) = \frac{(3.2x^{3-1} - 2.3 + 4 - 0)(x^2) - (2x^3 - 3x^2 + 4x - 5)(2x)}{(x^2)^2}$

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

17. $g(y) = \overset{U}{2y}\,\overbrace{(3y^2 - 1)(y^2 + 2y + 3)}^{V}$ $U'V + UV'$

$g'(y) = 2y(2.3y^{2-1} - 1)(y^2 + 2y + 3) + 2y(3y^2 - 1)(2y + 2 + 0)$

$g'(y) = 2y(6y^2 - 0)(y^2 + 2y + 3) + 2y(3y^2 - 1)(4y)$

$g'(y) = 2(6)(y^2 + 2y + 3) + 2y(3y^2 - 1)(4y)$

18. $f(x) = \frac{x^2 - 4}{x^2 + 4}$ $\frac{U}{V}$

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

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

Norma

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

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

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

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

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

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

Norma

$$21.\ U(t) = \frac{1}{(t-1)^3}$$

$$U'(t) = \frac{(0)(t-1)^3 - (1)\,3(t-1)^{3-1}(1+0)}{[(t-1)^3]^2}$$

$$U'(t) = \frac{(0) - ((t)-1)}{[(t-1)^2]^2}$$

$$22.\ h(x) = \frac{2.x^3 + x^2 - 3.x + 17}{2x-5.}$$

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

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

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

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

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

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

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

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

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

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

$g'(x) = 18x^2 - \cancel{27x^6} - 32x^{14} + 48x^{13} - \cancel{14x^{18}} + 28x^{14} + 18x^{11} - \cancel{36x^{13}}$

$g'(x) = \dfrac{4x^{15} - 13x^{14} + 12^{13}}{(2x^7 - 3x^6)^2}$