Taller matemáticas

1) $y = x^9$

$y' = 9x^8$ //

2) $y = x^{11}$

$y' = 11x^{10}$ //

3) $y = 23$

$y' = 0$ //

4) $y = x + 5$

$y' = 1 + 0$

$y' = 1$ //

5) $y = 4x + \pi$

$y = 4(1) + 0$

$y = 4$ //

6) $y = 4x^2 - x - 6$

$y' = 8x - 1 - 0$

$y' = 8x - 1$

7) $y = 2x^3 + 7x^2 - 8x - 7$

$y' = 6x^2 + 14x - 8 - 0$

$y' = 6x^2 + 14x - 8$

8) $y = 5x^5 + 3x^2 - 6x - 6$

$y' = 25x^4 + 6x - 6 - 0$

$y' = 25x^4 + 6x - 6$ //

9) $y = 7x^4 - x^3 + 5x^2$

$y' = 28x^3 - 3x^2 + 10x$ //

10) $y = \frac{3x^3}{4} - \frac{2x^2}{7} + 9x$

$y' = \frac{3}{4} 3x^2 - \frac{2}{7} 2x + 9x$

$y' = \frac{3}{4} 3x^2 - \frac{2}{7} 2x + 9$

$y' = \frac{9}{4} x^2 - \frac{4}{7} x + 9$ //

11) $y = \frac{2x^6}{3} + \frac{4x^5}{9} - \frac{1}{2}$

$y' = \frac{2}{3} x^6 + \frac{4}{9} x^5 - \frac{1}{2}$

$y' = \frac{12}{3} x^5 + \frac{20}{9} x^4 - 0$

$y' = 4x^5 + \frac{20}{9} x^4$ //

12) $y = \frac{9x^2}{2} - \frac{3x}{5} - 7$

$y' = \frac{9}{2} x^2 - \frac{3}{5} x - 0$

$y' = \frac{18}{2} x - \frac{3}{5}$

$y' = 9x - \frac{3}{5}$ //

13) $y = \frac{1}{x^4}$

$y' = x^{-4}$

$y' = -4x^{-5}$

$y' = -\frac{4}{x^5}$ //

14) $y = \frac{4}{x^8}$

$y' = 4x^{-8}$

$y' = -32x^{-9}$

$y' = -\frac{32}{x^9}$ //

15) $y = \frac{4}{x} - \frac{2}{x^3}$

$y = 4x^{-1} - 2x^{-3}$

$y' = -4x^{-2} + 6x^{-4}$

$y' = -\frac{4}{x^2} + \frac{6}{x^4}$ //

16) $y =$

16) $y = \frac{6}{3x^5} + \frac{2}{5x^2} - \frac{7}{9x}$

$y' = \frac{6}{3}x^{-5} + \frac{2}{5}x^{-2} - \frac{7}{9}x^{-1}$

$y' = \frac{6}{3} \cdot \frac{-5}{1}x^{-5-1} + \frac{2}{5} \cdot \frac{-2}{1}x^{-2-1} - \frac{7}{9} - \frac{1}{1}x^{-1-1}$

$y' = \frac{30}{3}x^{-6} - \frac{4}{5}x^{-3} - \frac{7}{9}x^{-2}$

$y' = -10x^{-6} - \frac{4}{5x^{-3}} - \frac{7}{9x^{-2}}$ //

17) $y = \frac{2}{9x^5} - \frac{3}{7x^4} + \frac{6}{5x}$

$y' = \frac{2}{9}x^{-5} - \frac{3}{7}x^{-4} + \frac{6}{5}x^{-1}$

$y' = \frac{2}{9} \cdot \frac{-5}{1}x^{-6} - \frac{3}{7} \cdot \frac{-4}{1}x^{-5} + \frac{6}{5} \cdot \frac{-1}{1}x^{-2}$

$y' = -\frac{10}{9}x^{-6} + \frac{12}{7}x^{-5} - \frac{6}{5}x^{-2}$ //

18) $y = \frac{8}{x^5} - \frac{1}{4x^2} + \frac{7}{6x}$

$y' = 8x^{-5} - \frac{1}{4}x^{-2} + \frac{7}{6}x^{-1}$

$y' = 8 \cdot (-5)x^{-6} - \frac{1}{4} \cdot \frac{-2}{1}x^{-3} + \frac{7}{6} \cdot \frac{-1}{1}x^{-2}$

$y' = -40x^{-6} + \frac{2}{4}x^{-3} - \frac{7}{6}x^{-2}$

$y' = -40x^{-6} + \frac{1}{2x^3} - \frac{7}{6x^2}$ //

19) $y = \sqrt[4]{x^5}$

$y = x^{\frac{5}{4}}$

$y' = \frac{5}{4} x^{\frac{5}{4}-1}$

$y' = \frac{5}{4} x^{\frac{1}{4}}$ //

20) $y = \sqrt[4]{x^9}$

$y = x^{\frac{9}{4}}$

$y' = \frac{9}{4} x^{\frac{9}{4}-1}$

$y' = \frac{9}{4} x^{\frac{5}{4}}$ //

21) $y = \sqrt[7]{x}$

$y = x^{\frac{1}{7}}$

$y' = \frac{1}{7} x^{\frac{1}{7}-1}$

$y' = \frac{1}{7} x^{-\frac{6}{7}}$

$y' = \frac{1}{7 x^{\frac{6}{7}}}$ //

22) $y = \sqrt[11]{x^2}$

$y = x^{\frac{2}{11}}$

$y' = \frac{2}{11} x^{\frac{2}{11}-1}$

$y' = \frac{2}{11} x^{-\frac{9}{11}}$

$y' = \frac{2}{11 x^{\frac{9}{11}}}$ //

23) $y = \frac{1}{\sqrt[8]{x^7}}$

$y = x^{-\frac{7}{8}}$

$y' = -\frac{7}{8} x^{-\frac{7}{8}-1}$

$y' = -\frac{7}{8} x^{-\frac{15}{8}}$

$y' = -\frac{7}{8 x^{\frac{15}{8}}}$ //

24) $y = \frac{3}{\sqrt[7]{x^{10}}}$

$y = 3x^{-\frac{10}{7}}$

$y' = \left(\frac{3}{1}\right)\left(-\frac{10}{7}\right) x^{-\frac{10}{7}-1}$

$y' = -\frac{30}{7} x^{-\frac{17}{7}}$

$y' = -\frac{30}{7 x^{\frac{17}{7}}}$ //

25) $y = \frac{3}{8\sqrt[9]{x^7}}$

$y = \frac{3}{8} x^{\frac{-7}{9}}$

$y' = \left(\frac{3}{8}\right)\left(-\frac{7}{9}\right) x^{\frac{-7}{9}-1}$

$y' = -\frac{21}{72} x^{\frac{-16}{9}}$

$y' = \frac{7}{24 x^{\frac{16}{9}}}$ //

26) $y = \frac{2}{9\sqrt[3]{x^2}}$

$y = \frac{2}{9} x^{\frac{-2}{3}}$

$y' = \left(\frac{2}{9}\right)\left(-\frac{2}{3}\right) x^{\frac{-2}{3}-1}$

$y' = -\frac{4}{27} x^{\frac{-5}{3}}$

$y' = -\frac{4}{27 x^{\frac{5}{3}}}$

EJERCICIO 10

1) $y = (7x^4 - 8x^3 + 8x^2 - 11x - 9)^7$

$y'(x) = 28x^3 - 24x^2 + 16x - 11$

$y' = 7(7x^4 - 8x^3 + 8x^2 - 11x - 9)^6 \cdot (28x^3 - 24x^2 + 16x - 11)$

$y' = (7x^4 - 8x^3 + 8x^2 - 11x - 9)^6 \cdot 7(28x^3 - 24x^2 + 16x - 11)$

$y' = (7x^4 - 8x^3 + 8x^2 - 11 - 9)^6 (196x^3 - 168x^2 + 112x - 77)$ //

2) $y = (x^5 + x^2 - 19x - 11)^9$

$y'(x) = 5x^4 + 2x - 19$

$y' = 9(x^5 + x^2 - 19x - 11)^8 (5x^4 + 2x - 19)$

$y' = (x^5 + x^2 - 19x - 11)^8 \cdot (9(5x^4 + 2x - 19)$

$y' = (x^5 + x^2 - 19x - 11)^8 (45x^4 + 18x - 171)$ //

3) $y = (4 - x - 6x^2 - x^3)^8$

$y'(x) = -1 - 12x - 3x^2$

$y' = 8(4 - x - 6x^2 - x^3)^7 (-1 - 12x - 3x^2)$

$y' = (4 - x - 6x^2 - x^3)^7 \cdot 8(-1 - 12x - 3x^2)$

$y' = (4 - x - 6x^2 - x^3)^7 (-8 - 96x - 24x^2)$ //

4) $y = (9 - x - 9x^5 + x^6)^6$

$y'(x) = -1 - 45x^4 + 6x^5$

$y' = 6(9 - x - 9x^5 + x^6)^5 (-1 - 45x^4 + 6x^5)$

$y' = (9 - x - 9x^5 + x^6)^5 \cdot 6(-1 - 45x^4 + 6x^5)$

$y' = (9 - x - 9x^5 + x^6)^5 (-6 - 270x^4 + 36x^5)$ //

5) $y = \sqrt{x^3 + 5x^2 + 9x - 1}$

$y = (x^3 + 5x^2 + 9x - 1)^{\frac{1}{2}}$

$y'(x) = 3x^2 + 10x + 9$

$y' = \frac{1}{2}(x^3 + 5x^2 + 9x - 1)^{-\frac{1}{2}} (3x^2 + 10x + 9)$

$y' = \frac{3x^2 + 10x + 9}{2(x^3 + 5x^2 + 9x - 1)^{\frac{1}{2}}}$

$y' = \frac{3x^2 + 10x + 9}{2\sqrt{x^3 + 5x^2 + 9x - 1}}$ //

6) $y = \sqrt{(x^2+x+2)^7}$

$y = (x^2+x+2)^{\frac{7}{2}}$

$y'(x) = 2x+1$

$y' = \frac{7}{2}(x^2+x+2)^{\frac{5}{2}}(2x+1)$

$y' = \frac{(x^2+x+2)^{\frac{5}{2}} \cdot 7(2x+1)}{2}$

$y' = \frac{(x^2+x+2)^{\frac{5}{2}}(14x+7)}{2}$

$y' = \frac{\sqrt{(x^2+x+2)^5} \cdot (14x+7)}{2}$ //

7) $y = \sqrt{(3x^2-4x-4)^9}$

$y = (3x^2-4x-4)^{\frac{9}{2}}$

$y'(x) = 6x-4$

$y' = \frac{9}{2}(3x^2-4x-4)^{\frac{7}{2}}(6x-4)$

$y' = \frac{(3x^2-4x-4)^{\frac{7}{2}} \cdot 9(6x-4)}{2}$

$y' = \frac{(3x^2-4x-4)^{\frac{7}{2}}(54x-36)}{2}$

$y' = \frac{\sqrt{(3x^2-4x-4)^7} \cdot (54x-36)}{2}$ //

8) $y = \sqrt[5]{(7-5x^3)^6}$

$y = (7-5x^3)^{\frac{6}{5}}$

$y'(x) = -15x^2$

$y' = \frac{6}{5}(7-5x^3)^{\frac{1}{5}}(-15x^2)$

$y' = \frac{6(-15x^2)(7-5x^3)^{\frac{1}{5}}}{5}$

$y' = \frac{(-90x^2)(7-5x^3)^{\frac{1}{5}}}{5}$

$y' = \frac{(-90x^2)\cdot\sqrt[5]{7-5x^3}}{5}$ //

9) $y = \sqrt[10]{(6-x)^{11}}$

$y = (6-x)^{\frac{11}{10}}$

$y'(x) = -1$

$y' = \frac{11}{10}(6-x)^{\frac{1}{10}} \cdot (-1)$

$y' = \frac{(-11)\cdot\sqrt[10]{6-x}}{10}$ //

10) $y = \sqrt[7]{(8-3x-x^5)^4}$

$y = (8-3x-x^5)^{\frac{4}{7}}$

$y'(x) = -3-5x^4$

$y' = \frac{4}{7}(8-3x-x^5)^{\frac{-3}{7}}(-3-5x^4)$

$$y' = \frac{4(-3-5x^4)}{7(8-3x-x^5)^{\frac{3}{7}}}$$

$$y' = \frac{-12-20x^4}{7\sqrt[7]{(8-3x-x5)^3}} //$$

11) $y = 12\sqrt[7]{(5x-x^3-7x^4)^8}$

$y = 12(5x-x^3-7x^4)^{\frac{8}{7}}$

$y'(x) = 5-3x^2-28x^3$

$y' = 12 \cdot \frac{8}{7}(5x-x^3-7x^4)^{\frac{1}{7}} \cdot (5-3x^2-28x^3)$

$y' = \frac{96}{7}(5x-x^3-7x)^{\frac{1}{7}} \cdot (5-3x^2-28x^3)$

$$y' = \frac{(5x-x^3-7x)^{\frac{1}{7}} \cdot 96(5-3x^2-28x^3)}{7}$$

$$y' = \frac{\sqrt[7]{5x-x3-7x} \cdot (480-288x^2-2688x^3)}{7} //$$

12) $7\sqrt[10]{(6x-6x^2-x7)^9}$

$y = 7(6x-6x^2-x^7)^{\frac{9}{10}}$

$y'(x) = 6-12x-7x^6$

$y' = 7 \cdot \frac{9}{10}(6x-6x^2-x^7)^{-\frac{1}{10}}(6-12x-7x^6)$

$y' = \frac{63}{10}(6x-6x^2-x^7)^{\frac{-1}{10}}(6-12x-7x^6)$

$$y' = \frac{63(6-12x-7x^6)}{10(6x-6x^2-x^2)^{\frac{1}{10}}}$$

$$y' = \frac{378-756x-441x^6}{10\sqrt[10]{6x-6x^2-x^2}^{9}} //$$

13) $y = \frac{13}{x^2+8x+11}$

$y'(x) = 2x+8$

$y = 13(x^2+8x+11)^{-1}$

$y' = 13 \cdot -1(x^2+8x+11)^{-2} \cdot (2x+8)$

$y' = -13(x^2+8x+11)^{-2}(2x+8)$

$$y' = \frac{(-26x-104)}{(x^2+8x+11)^2} //$$

14) $y = \frac{11}{(x-9x^4)^5}$

$y'(x) = 1-36x^3$

$y = 11(x-9x^4)^{-5}$

$y' = 11 \cdot -5(x-9x^4)^{-6}(1-36x^3)$

$$y' = \frac{-55(1-36x^3)}{(x-9x^4)^6}$$

$$y' = \frac{-55+1980x^3}{(x-9x^4)^6}$$

15) $y = \frac{17}{(x^3 - x^2 - x)^7}$

$y'(x) = 3x^2 - 2x - 1$

$y = 17(x^3 - x^2 - x)^{-7}$

$y' = 17 \cdot -7(x^3 - x^2 - x)^{-8}(3x^2 - 2x - 1)$

$y' = \frac{-119(3x^2 - 2x - 1)}{(x^3 - x^2 - x)^8}$

$y' = \frac{-357x^2 + 238x + 119}{(x^3 - x^2 - x)^8}$ //

17) $y = \frac{17}{5\sqrt[3]{(x^4 + x^2 - x)^7}}$

$y' = \frac{17}{5}(x^4 + x^2 - x)^{\frac{-7}{3}}$

$y' = \frac{17}{5} \cdot -\frac{7}{3}(x^4 + x^2 - x)^{-\frac{10}{3}}(4x^3 + 2x - 1)$

$y' = \frac{-119(4x^3 + 2x - 1)}{5(x^4 + x^2 - x)^{\frac{10}{3}}}$

$y' = \frac{-476x^3 - 238x + 119}{5\sqrt[3]{(x^4 + x^2 - x)^{10}}}$ //

16) $y = \frac{9}{5(3x^2+5x+6)^8}$

$y'(x) = 6x+5$

$y = \frac{9}{5}(3x^2+5x+6)^{-8}$

$y' = \frac{9}{5} \cdot -8(3x^2+5x+6)^{-9}(6x+5)$

$y' = \frac{-72}{5}(3x^2+5x+6)^{-9}(6x+5)$

$y' = -\frac{72(6x+5)}{5(3x^2+5x+6)^9}$

$y' = \frac{432x+360}{5(3x^2+5x+6)^9}$ //

18) $y' = \frac{9}{4\sqrt[3]{(x^3-11x^2-9x+7)^8}}$

$y'(x) = 3x^2-22x-9$

$y = \frac{9}{4}(x^3-11x^2-9x+7)^{\frac{-8}{3}}$

$y' = \frac{9}{4} \cdot -\frac{8}{3}(x^3-11x^2-9x+7)^{\frac{-11}{3}}(3x^2-22x-9)$

$y' = \frac{72(3x^2-22x-9)}{4(x^3-11x^2-9x+7)^{\frac{11}{3}}}$

$y' = \frac{216x^2-1584x-648}{4\sqrt[3]{(x^3-11x^2-9x+7)^{11}}}$ //

19) $y = \frac{8}{9\sqrt[3]{(9x^2+18x-11)^8}}$

$y'(x) = 18x+18$

$y = \frac{8}{9}(9x^2+18x-11)^{-\frac{11}{3}}(18x+18)$

$y' = \frac{64(18x+18)}{27(9x^2+18x-11)^{\frac{11}{3}}}$

$y' = \frac{-1152x-1152}{27\sqrt[3]{(9x^2+18x-11)^{11}}}$ //

20) $y = \frac{12}{5\sqrt[9]{(6x-12x^5)^{10}}}$

$y'(x) = 6-60x^4$

$y = \frac{12}{5}(6x-12x^5)^{-\frac{10}{9}}$

$y' = \frac{12}{5}\cdot\frac{-10}{9}(6x-12x^5)^{-\frac{19}{9}}(6-60x^4)$

$y' = \frac{-120(6-60x^4)}{45(6x-12x^5)^{\frac{19}{9}}}$

$y' = \frac{-720+7200x^4}{45\sqrt[9]{(6x-12x^5)^{19}}}$ //