Derivadas

1) $y = 6x^3 - x^2 \to y' = 18x^2 - 2x \to y'' = 36x - 2 \to y''' = 36 \to y^{iv} = 0$

2) $y = \dfrac{x^3 - x^2 + 1}{5} \to y' = \dfrac{3x^2 - 2x}{5} \to y'' = \dfrac{6x - 2}{5} \to y''' = \dfrac{6}{5} \to y^{iv} = 0$

3) $y = 6x^{\frac{7}{2}} + 4x^{\frac{5}{2}} + 2x \to y' = 21x^{\frac{5}{2}} + 10x^{\frac{3}{2}} + 2 \to y'' = \dfrac{105}{2}x^{\frac{3}{2}} + 15x^{\frac{1}{2}}$

4) $y = \sqrt{3x} + \sqrt[3]{x} + \dfrac{1}{x} \to y' = \dfrac{3}{2\sqrt{3x}} + \dfrac{1}{3\sqrt[3]{x^2}} - \dfrac{1}{x^2}$

5) $y = \dfrac{5 - x}{5 + x} \to y' = \dfrac{-10}{(5 + x)^2} \to y'' = \dfrac{20}{(5 + x)^3}$

6) $y = \dfrac{x^3}{x^2 + 1} \to y' = \dfrac{x^4 + 3x^2}{\left(x^2 + 1\right)^2}$

7) $y = (2x^2 - 3)^2 \to y' = 16x^3 - 24x \to y'' = 48x^2 - 24 \to y''' = 96x$

8) $y = \sqrt{\cos x} \to y' = \dfrac{-senx}{2\sqrt{\cos x}}$

9) $y = tg(2x + \pi) \to y' = \dfrac{2}{\cos^2(2x + \pi)}$

10) $y = e^{x - 3x^4} \to y' = e^{x - 3x^4} \cdot (1 - 12x^3)$

11) $y = 7xsenx \to y' = 7senx + 7x\cos x$

12) $y = \ln(x^3 - 5x^2) \to y' = \dfrac{3x^2 - 10x}{x^3 - 5x^2}$

13) $y = 2^{\ln x} \to y = 2^{\ln x} \cdot \ln 2 \cdot \dfrac{1}{x}$

14) $y = 5x^3 + \sqrt{x} \to y' = 15x^2 + \dfrac{1}{2\sqrt{x}}$

15) $y = e^x + e^{-x} \to y' = e^x - e^{-x} \to y'' = e^x + e^{-x}$

16) $y = \dfrac{1}{2 + senx} \to y = \dfrac{-\cos x}{(2 + senx)^2}$

17) $y = \dfrac{x^6}{6} + \dfrac{sen(7x)}{7} \to y' = x^3 + \cos 7x \to y'' = 5x^4 - 7sen(7x)$

18) $y = \cos^3 x \to y' = -3\cos^2 xsenx \to y'' = 6\cos x \cdot sen^2x - 3\cos^3 x$

19) $y = \dfrac{2x - 1}{(x - 2)x} \to y' = \dfrac{-2x^2 + 2x - 2}{(x^2 - 2x)^2}$

20) $y = \dfrac{x^3 + 1}{-x^2 + 2} \to y' = \dfrac{-x^4 + 6x^2 + 2x}{(-x^2 + 2)^2}$

21) $y = \dfrac{x^2 + 4x}{x^2 + 3x - 4} \to y' = \dfrac{-x^2 - 8x - 16}{(x^2 + 3x - 4)^2}$

22) $y = sen8x + \cos 8x \to y' = 8\cos 8x - 8sen8x$

2.-Calcula las siguientes derivadas:

1) $f(x) = \sqrt[5]{x}$ $\qquad$ $f'(x) = \dfrac{1}{5\sqrt[5]{x^4}}$

2) $f(x) = 6x^2 - 3x + 8$ $\qquad$ $f'(x) = 12x - 3$

3) $f(x) = \dfrac{1}{\sqrt{x}}$ $\qquad$ $f'(x) = \dfrac{-1}{2x\sqrt{x}}$

4) $f(x) = \dfrac{3x}{x+1}$ $\qquad$ $f'(x) = \dfrac{3}{(x+1)^2}$

5) $f(x) = (6x^5 + 4)\sqrt{x}$ $\qquad$ $f'(x) = 30x^4\sqrt{x} + \dfrac{6x^5 + 4}{2\sqrt{x}}$

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

7) $f(x) = 8\dfrac{1}{x^4}$ $\qquad$ $f'(x) = \dfrac{-32}{x^5}$

8) $f(x) = e^x tgx$ $\qquad$ $f'(x) = e^x \cdot tgx + \dfrac{e^x}{\cos^2 x}$

9) $f(x) = e^x senx \cos x$ $\qquad$ $f'(x) = e^x \cdot senx \cdot \cos x + e^x \cos^2 x - e^x sen^2$

10) $f(x) = e^x senx \cdot \cos x$ $\qquad$ $f'(x) = e^x senx \cdot \cos x + e^x \cos^2 x - e^x sen^2 x$

11) $f(x) = xe^x \ln x$ $\qquad$ $f'(x) = e^x \ln x + xe^x \ln x + e^x$

12) $f(x) = senx \cdot \cos x$ $\qquad$ $f'(x) = \cos^2 x - sen^2 x$

13) $f(x) = e^x senx - e^x \cos x$ $\quad$ $f'(x) = 2e^x senx$

14) $f(x) = \dfrac{e^x}{3\ln x}$ $\qquad$ $f'(x) = \dfrac{e^x\left(\ln x - \dfrac{1}{x}\right)}{3\ln^2 x}$

15) $f(x) = \ln x - \dfrac{1}{x}$ $\qquad$ $f'(x) = \dfrac{1}{x} + \dfrac{1}{x^2}$

16) $f(x) = \dfrac{\ln x}{e^x}$ $\qquad$ $f'(x) = \dfrac{\dfrac{1}{x} - \ln x}{e^x}$

17) $f(x) = 4\ln x$ $\qquad$ $f'(x) = \dfrac{4}{x}$

18) $f(x) = x\ln x$ $\qquad$ $f'(x) = \ln x + 1$

19) $f(x) = \dfrac{3x^3 - 6x^2 + 1}{x^2 + 3}$ $\qquad$ $f'(x) = \dfrac{3x^4 + 27x^2 - 38x}{(x^2 + 3)^2}$

20) $f(x) = 8tgx + \ln x$ $\qquad$ $f'(x) = \dfrac{8}{\cos^2 x} + \dfrac{1}{x}$

21) $f(x) = 5x^3 \ln x$ $\qquad$ $f'(x) = 15x^2 \ln x + 5x^2$

22) $f(x) = -7\sqrt[7]{7}$ $\qquad$ $f'(x) = -\dfrac{1}{\sqrt[7]{x^6}}$

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23) $f(x) = sen(x^2 + 2x)$ $f'(x) = (2x + 2)\cos(x^2 + 2x)$

24) $f(x) = sen(x + 1)$ $f'(x) = \cos(x + 1)$

25) $f(x) = \cos 4x$ $f'(x) = -4 sen 4x$

26) $f(x) = (3x^2 + 6)^7$ $f'(x) = 7(3x^2 + 6)^6 \cdot 6x$

27) $f(x) = e^{4x+5}$ $f'(x) = 4e^{4x+5}$

28) $f(x) = \ln x^2$ $f'(x) = \dfrac{1}{x^2} \cdot 2x = \dfrac{2}{x}$

29) $f(x) = \ln\left(\sqrt{x}\right)$ $f'(x) = \dfrac{1}{2x}$

30) $tg(4x^2 + 5)$ $f'(x) = \dfrac{8x}{\cos^2(4x^2 + 5)}$

31) $f(x) = \ln(sen x)$ $f'(x) = \dfrac{\cos x}{sen x}$

32) $f(x) = \cos^5 x$ $f'(x) = 5\cos^4 x \cdot (-sen x) = -5\cos^4 x sen x$

33) $f(x) = \sqrt{3x^2 + 6x - 10}$ $f'(x) = \dfrac{6x + 6}{2\sqrt{3x^2 + 6x - 10}}$

34) $f(x) = \ln(\ln x)$ $f'(x) = \dfrac{1}{x \ln x}$

35) $f(x) = sen^2 x$ $f'(x) = 2 sen x \cos x$

36) $f(x) = e^{-x^2}$ $f'(x) = -2x \cdot e^{-x^2}$

37) $f(x) = \dfrac{sen^2 x}{\sqrt{x^2 + 2}}$ $f'(x) = \dfrac{2 sen x \cos x \sqrt{x^2 + 2} - sen^2 x \dfrac{2x}{2\sqrt{x^2 + 2}}}{x^2 + 2} =$

$$= \dfrac{2 sen x \cos x (x^2 + 2) - x sen^2 x}{(x^2 + 2)\sqrt{x^2 + 2}}$$

38) $f(x) = \dfrac{(x+1)^2}{\ln(x+4)}$ $f'(x) = \dfrac{2(x+1) \cdot \ln(x+4) - \dfrac{(x+1)^2}{x+4}}{\left[\ln(x+4)\right]^2}$

$39)\, f(x) = \ln\left(\sqrt{\dfrac{x+1}{x-1}}\right) \qquad f'(x) = \dfrac{-1}{x^2-1}$

$40)\, f(x) = \ln\left(\sqrt{4x^2-6x}\right) \quad f'(x) = \dfrac{4x-3}{4x^2-6x}$

$41)\, f(x) = \dfrac{e^x + e^{-x}}{e^x - e^{-x}} \qquad f'(x) = \dfrac{-4}{\left(e^x - e^{-x}\right)^2}$