Deriva las siguientes funciones:

1.- $f(x)=\sqrt[3]{x^2}$

2.- $f(x)=Ln\,5$

3.- $f(x)=\dfrac{x}{\sqrt[3]{x}}$

4.- $f(x)=\dfrac{1}{x}$

5.- $f(x)=\dfrac{1}{x^2}$

6.- $f(x)=\dfrac{1}{x^3}$

7.- $f(x)=\dfrac{1}{x^4}$

8.- $f(x)=\dfrac{1}{x^3+3x^2+3x+1}$

9.- $f(x)=\dfrac{1}{\left(x^2+x+1\right)^5}$

10.- $f(x)=\dfrac{x^2-1}{x^2+1}$

11.- $f(x)=\log_4(x^2+x+1)$

12.- $f(x)=\log_6(sen\ x)$

13.- $f(x)=\log_8(\cos x)$

14.- $f(x)=\log_2\sqrt{x}$

15.- $f(x)=Ln\left(x^2+1\right)^2$

16.- $f(x)=Ln\sqrt{sen\ x}$

17.- $f(x)=sen\,x\cdot Ln\,x$

18.- $f(x)=\cos\left(Ln\sqrt{x}\right)$

19.- $f(x)=tg\,x^{-2}$

20.- $f(x)=tg\left(e^x\right)$

21.- $f(x)=tg\left(5^x\right)$

22.- $f(x)=tg^{-2}\,x$

23.- $f(x)=\sqrt[3]{tg\,x}$

24.- $f(x)=\cot g\left(-3x+6\right)^7$

25.- $f(x)=arc\,sen\,2x$

26.- $f(x)=arc\,sen\left(x^2+1\right)$

27.- $f(x)=arc\,sen\sqrt{x}$

28.- $f(x)=arc\,tg\left(x^2+1\right)$

29.- $f(x)=arc\,tg\sqrt{x}$

30.- $f(x)=arc\,tg\,(Ln\,x)$

31.- $f(x)=arc\,tg\left(e^x\right)$

32.- $f(x)=arc\,sen\left(2x\sqrt{1-x^2}\right)$

33.- $f(x)=Ln\left(x+1+\sqrt{x^2+2x+1}\right)$

SOLUCIONES

1.- $y = \sqrt[3]{x^2} = x^{2/3}$ $\quad y' = \frac{2}{3} x^{-1/3}$

2.- $y = \ln 5$ $\quad y' = 0$

3.- $y = \frac{x}{\sqrt[3]{x}} = x^{2/3}$ $\quad y' = \frac{2}{3} x^{-1/3}$

4.- $y = \frac{1}{x} = x^{-1}$ $\quad y' = -1x^{-2} = \frac{-1}{x^2}$

5.- $y = \frac{1}{x^2} = x^{-2}$ $\quad y' = -2x^{-3} = \frac{-2}{x^3}$

6.- $y = \frac{1}{x^3} = x^{-3}$ $\quad y' = -3x^{-4} = \frac{-3}{x^4}$

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

8.- $y = \frac{1}{x^3+3x^2+3x+1} = \frac{1}{(x+1)^3} = (x+1)^{-3}$ $\quad y' = -3(x+1)^{-4}$

9.- $y = \frac{1}{(x^2+x+1)^5} = (x^2+x+1)^{-5}$ $\quad y' = -5(x^2+x+1)^{-6} \cdot (2x+1)$

10.- $y = \frac{x^2-1}{x^2+1}$ $\quad y' = \frac{2x(x^2+1)-(x^2-1)2x}{(x^2+1)^2} = \frac{4x}{(x^2+1)^2}$

11.- $y = \log_4(x^2+x+1)$ $\quad y' = \frac{2x+1}{x^2+x+1} \cdot \log_4 e$

12.- $y = \log_6(\operatorname{sen} x)$ $\quad y' = \frac{\cos x}{\operatorname{sen} x} \cdot \log_6 e$

13.- $y = \log_8(\cos x)$ $\quad y' = \frac{-\operatorname{sen} x}{\cos x} \cdot \log_8 e$

14.- $y = \log_2 \sqrt{x}$ $\quad y' = \frac{1/2\sqrt{x}}{\sqrt{x}} \cdot \log_2 e = \frac{1}{2x} \log_2 e$

15.- $y = \ln (x^2+1)^2$ $\quad y' = \frac{2(x^2+1) \cdot 2x}{(x^2+1)^2} = \frac{4x}{x^2+1}$

16.- $y = \ln (\sqrt{\operatorname{sen} x})$ $\quad y' = \frac{1}{\sqrt{\operatorname{sen} x}} \cdot \frac{1}{2\sqrt{\operatorname{sen} x}} \cdot \cos x = \frac{\cos x}{2 \cdot \operatorname{sen} x}$

17.- $y = \ln x \cdot \operatorname{sen} x$ $\quad y' = \cos x \cdot \ln x + \frac{\operatorname{sen} x}{x}$

18.- $y = \cos(\ln(\sqrt{x}))$ $\quad y' = -\operatorname{sen}(\ln(\sqrt{x})) \cdot \frac{1}{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}} = \frac{-\operatorname{sen}(\ln(\sqrt{x}))}{2x}$

19.- $y = \operatorname{tg} x^{-2}$ $\quad y' = [1 + \operatorname{tg}^2(x^{-2})](-2x^{-3})$

20.- $y = \operatorname{tg}(e^x)$ $\quad y' = [1 + \operatorname{tg}^2(e^x)] \cdot e^x$

21.- $y = \operatorname{tg}(5^x)$ $\quad y' = [1 + \operatorname{tg}^2(5^x)] \cdot 5^x \cdot \ln 5$

22.- $y = \operatorname{tg}^{-2} x$ $\quad y' = -2 \operatorname{tg}^{-1} x \cdot (1 + \operatorname{tg}^2 x)$

23.- $y = \sqrt[3]{\operatorname{tg} x}$ $\quad y' = \frac{1}{3} \operatorname{tg}^{-2/3} x \, (1 + \operatorname{tg}^2 x)$

24.- $y = \operatorname{cotg} (-3x+6)^7$ $\quad y' = [-1 - \operatorname{cotg} (-3x+6)^7] \cdot 7(-3x+6)^6 \cdot (-3)$

25.- $y = \arcsin 2x \qquad y' = \dfrac{2}{\sqrt{1-4x^2}}$

26.- $y = \arcsin(x^2+1) \qquad y' = \dfrac{2x}{\sqrt{1-(x^2+1)^2}}$

27.- $y = \arcsin\sqrt{x} \qquad y' = \dfrac{\frac{1}{2\sqrt{x}}}{\sqrt{1-(\sqrt{x})^2}} = \dfrac{1}{2\sqrt{x-x^2}}$

28.- $y = \operatorname{arctg}(x^2+1) \qquad y' = \dfrac{2x}{1+(x^2+1)^2} = \dfrac{2x}{x^4+2x^2+2}$

29.- $y = \operatorname{arctg}(\sqrt{x}) \qquad y' = \dfrac{\frac{1}{2\sqrt{x}}}{1+(\sqrt{x})^2} = \dfrac{1}{2\sqrt{x}(1+x)}$

30.- $y = \operatorname{arctg}(\ln x) \qquad y' = \dfrac{1/x}{1+(\ln x)^2} = \dfrac{1}{x(1+\ln^2 x)}$

31.- $y = \operatorname{arctg}(e^x) \qquad y' = \dfrac{e^x}{1+e^{2x}}$

32.- $y = \operatorname{arctg}(2x \cdot \sqrt{1-x^2})$

$$y' = \frac{2\sqrt{1-x^2} + 2x\,\frac{-2x}{2\sqrt{1-x^2}}}{1+(2x\sqrt{1-x^2})^2} = \frac{2\sqrt{1-x^2} - \frac{2x^2}{\sqrt{1-x^2}}}{1+4x^2(1-x^2)}$$

$$= \frac{\frac{2(\sqrt{1-x^2})^2 - 2x^2}{\sqrt{1-x^2}}}{1+4x^2-4x^4} = \frac{2-4x^2}{\sqrt{1-x^2}\,(1+4x^2-4x^4)}$$

33.- $y = \ln\left(x+1+\sqrt{x^2+2x+1}\right) =$

$$= \ln\left(x+1+\sqrt{(x+1)^2}\right) =$$

$$= \ln(x+1+x+1) = \ln(2x+2)$$

$$y' = \frac{2}{2x+2} = \frac{1}{x+1}$$

34.- $y = \frac{\ln x}{x} \quad y' = \frac{\frac{1}{\cancel{x}}\cdot\cancel{x} - 1\cdot\ln x}{x^2} = \frac{1-\ln x}{x^2}$

35.- $y = \frac{x^3}{(x-1)^2} \Rightarrow y' = \frac{3x^2(x-1)^{\cancel{2}} - x^3\, 2\,\cancel{(x-1)}}{(x-1)^{\cancel{4}\,3}} =$

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