REGLAS DE DERIVACIÓN

1.- EJERCICIOS PROPUESTOS

Calcular la derivada de las siguientes funciones:

1. $y = \frac{1}{x} + \frac{3}{x^2} + \frac{2}{x^3}$
2. $y = \sqrt[3]{3x^2} - \frac{1}{\sqrt{5x}}$
3. $y = (1-5x)^6$
4. $y = \sin(x^2)$
5. $y = \sin^3(x^2)$
6. $y = \frac{1}{\cos x}$
7. $y = 2^{3x}$
8. $y = e^{x^3}$
9. $y = x^{\sin x}$
10. $y = (1+x)^{1/x}$
11. $y = \mathrm{L}\left(\sqrt{1+x^2}\right)$
12. $y = (\sin x)^{\mathrm{L}x}$
13. $y = \sqrt{1-x^2} \cdot \arcsin x$
14. $y = 2\arctan\left(\sqrt{\frac{1-\cos x}{1+\cos x}}\right) \quad \forall x \in [0, \pi)$
15. $y = \frac{x}{2}\sqrt{x^2+9} + \frac{9}{2}\mathrm{L}\left(x + \sqrt{x^2+9}\right)$
16. $y = \mathrm{L}\left(\frac{1+\sqrt{2}x+x^2}{1-\sqrt{2}x+x^2}\right) + 2\arctan\left(\frac{\sqrt{2}x}{1-x^2}\right)$
17. $y = a^{\tan(\mathrm{L}(\cos x))}$
18. $y = x^{x \cdot \sin x}$
19. $y = x^{x^x}$

2.- SOLUCIONES DE LOS EJERCICIOS PROPUESTOS

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

3. $y' = -30(1-5x)^5$

4. $y' = 2x\cos(x^2)$

5. $y' = 6x\sin^2(x^2)\cos(x^2)$

6. $y' = \dfrac{\sin x}{\cos^2 x}$

7. $y' = 3\cdot 2^{3x}\cdot \mathrm{L}2$

8. $y' = 3x^2\cdot e^{x^3}$

9. $y' = \left[\cos x\cdot \mathrm{L}x + \dfrac{\sin x}{x}\right]\cdot x^{\sin x}$

10. $y' = \left[-\dfrac{\mathrm{L}(1+x)}{x^2} + \dfrac{1}{x(1+x)}\right]\cdot (1+x)^{1/x}$

11. $y' = \dfrac{x}{1+x^2}$

12. $y' = \left[\dfrac{\mathrm{L}(\sin x)}{x} + \cot x\cdot \mathrm{L}x\right]\cdot (\sin x)^{\mathrm{L}x}$

13. $y' = -\dfrac{x}{\sqrt{1-x^2}}\cdot \arcsin x + 1$

14. $y' = 1 \quad \forall x \in [0,\pi)$

15. $y' = \sqrt{x^2+9}$

16. $y' = \dfrac{4\sqrt{2}}{1+x^4}$

17. $y' = -\dfrac{\tan x}{\cos^2\left(\mathrm{L}\left(\cos x\right)\right)}\cdot a^{\tan\left(\mathrm{L}\left(\cos x\right)\right)}\cdot \mathrm{L}a$

18. $y' = \left(\sin x\cdot \mathrm{L}x + x\cdot\cos x\cdot \mathrm{L}x + \sin x\right)\cdot x^{x\cdot \sin x}$

19. $y' = \left[(\mathrm{L}x+1)\cdot \mathrm{L}x + \dfrac{1}{x}\right]\cdot x^x\cdot x^{x^x}$