



1.- Dada la ley de correspondencia, determine la composición que se indica. (Suponga que los requerimientos del dominio se satisfacen).

- (a) $f(x) = \sqrt{x}$, $g(x) = x^2 + x - 1$, $y = f(g(x))$. (j) $f(x) = \frac{x}{1-x^2}$, $g(x) = 2-x$, $y = f(g(x))$.
 (b) $f(x) = \sqrt{x+1}$, $g(x) = x^2 + x - 1$, $y = f(g(x))$. (k) $f(x) = \frac{x^2}{x-1}$, $g(x) = x+2$, $y = f(g(x))$.
 (c) $f(x) = \sqrt{x} - 1$, $g(x) = x^2 + x - 1$, $y = f(g(x))$. (l) $f(x) = \frac{x^2}{x-1}$, $g(x) = e^x$, $y = f(g(x))$.
 (d) $f(x) = \sqrt{x^2-1}$, $g(x) = x^2+x-1$, $y = f(g(x))$. (m) $f(x) = \frac{x^2}{x^2-1}$, $g(x) = e^{2x}$, $y = f(g(x))$.
 (e) $f(x) = \ln(x+1)$, $g(x) = 3-2x$, $y = f(g(x))$. (n) $f(x) = \frac{x^2}{1-x}$, $g(x) = e^x$, $y = f(g(x))$.
 (f) $f(x) = \ln(x-1)$, $g(x) = 3-2x$, $y = f(g(x))$. (ñ) $f(x) = \frac{x^2}{x^2-x+1}$, $g(x) = e^{-2x}$, $y = f(g(x))$.
 (g) $f(x) = \ln(x) - 2x$, $g(x) = 3-2x$, $y = f(g(x))$.
 (h) $f(x) = \ln(x^2-1)$, $g(x) = 3-2x$, $y = f(g(x))$.
 (i) $f(x) = \frac{x-1}{x+1}$, $g(x) = 1-2x$, $y = f(g(x))$.

2.- Determine dos funciones. f y g tales que $y = f(g(x))$.

- (a) $y = \sqrt{\ln(x)}$ (i) $y = e^{-x}$ (o) $y = \frac{\ln(x)}{\ln(x)\sqrt{4-\ln^2(x)}}$
 (b) $y = \sqrt{3x-1}$ (j) $y = e^{1-2x}$
 (c) $y = \ln(1-4x)$ (k) $y = e^{2x} - e^x - 4$ (p) $y = \frac{e^{-x}}{1-e^{-x}}$
 (d) $y = \ln^2(x)$ (l) $y = \frac{1}{x^2+x}$ (q) $y = \frac{4e^x}{1-e^{2x}}$
 (e) $y = \ln^2(3x^2+1)$ (m) $y = \frac{2}{(1-3x)^2}$ (r) $y = \frac{1}{\sqrt{4+e^{-2x}}}$
 (f) $y = (4x-1)^2$ (n) $y = \frac{1}{1-\sqrt{x}}$ (s) $y = \frac{1}{e^{2x}\sqrt{4e^{2x}-e^x}}$
 (g) $y = \left(\frac{x}{1-x}\right)^2$ (ñ) $y = \frac{1}{\sqrt{1-\ln(x)}}$

3.- Graficar cada una de las siguientes relaciones:

- (a) $y = 6-3x$ (f) $y = x^2+2x-1$ (k) $y = (x-1)^3+1$
 (b) $y = 3x+6$ (g) $y = 2x^2-6x+8$ (l) $y = 4x^3-9x$
 (c) $y = 3-2x$ (h) $x = y^2+6y$ (m) $4x^2+2y^2-8=0$
 (d) $8x-4y-12=0$ (i) $2x^2+2y^2-8=0$ (n) $y = \sqrt{x-2}+1$
 (e) $y = x^2-4x$ (j) $4x^2-2y^2-8=0$ (ñ) $y = \sqrt{3-4x}$

4.- Sea $f(x) = \ln \left(\sqrt{\frac{\sin(x) + \cos(x)}{\sin(x) - \cos(x)}} \right)$. Muestre que $f'(x) = \frac{1}{\cos(2x)}$.



5.- Calcular la primera derivada de cada una de las siguientes funciones:

1. $y = x^5 - 4x^3 + 2x - 3$
2. $y = \frac{1}{4} - \frac{1}{3}x - x^2 - \frac{1}{2}x^4$
3. $y = 3t^3 + 4t^5$
4. $y = \frac{2}{2x-1} - \frac{1}{x}$
5. $y = \frac{\pi}{x} + \ln(x)$
6. $y = 3x^{2/3} - 2x^{5/2} + x^{-3}$
7. $y = x^2\sqrt[3]{x^2}$
8. $y = \frac{9}{\sqrt[3]{x^2}} - \frac{b}{x\sqrt[3]{x}}$
9. $y = \frac{a+bx}{c+dx}$
10. $y = \frac{2x+3}{x^2-5x+5}$
11. $y = \frac{1+\sqrt{z}}{1-\sqrt{z}}$
12. $y = 5\sin(x) + 3\cos(x)$
13. $y = \tan(x) - \cot(x)$
14. $y = \frac{\sin(x) + \cos(x)}{\sin(x) - \cos(x)}$
15. $y = 2t\sin(t) - (t^2 - 2)\cos(t)$
16. $y = \arctan(x) - \arccos(x)$
17. $y = x \cot(x)$
18. $y = \frac{(1+x^2)\arctan(x) - x}{2}$
19. $y = x^7 e^x$
20. $y = (x-1)e^x$
21. $y = \frac{e^x}{x^2}$
22. $y = \frac{x^5}{e^x}$
23. $y = e^x \cos(x)$
24. $y = (x^2 - 2x + 2)e^x$
25. $y = x^3 \ln(x) - \frac{x^3}{3}$
26. $y = \frac{3-x}{2+x}$
27. $y = \frac{2-4x}{1+3x}$
28. $y = \frac{x^2}{1+x^2}$
29. $y = \frac{4x^2}{2+x^2}$
30. $y = \frac{x^2+2x-1}{x+4}$
31. $y = \frac{x^3}{1-x^2}$
32. $y = 1 - \frac{1}{x^2}$
33. $y = \frac{3x^2+4x}{1-2x}$
34. $y = \frac{2x-3}{1+2x^2}$
35. $y = \frac{3x^2-4x}{x^2+4}$
36. $y = \frac{x^2-4x+5}{x \ln(x)}$

6.- Para cada una de las siguientes ecuaciones, determine y' .

- (a) $x^2 + y^2 = 16$
- (b) $x^3 + y^3 = 8xy$
- (c) $x^3 + 3y^2 = 2x^2y$
- (d) $\frac{1}{x} + \frac{1}{y} = 1$
- (e) $\sqrt{x} + \sqrt{y} = 4$
- (f) $x^2y^2 = x^2 + y^2$
- (g) $\sqrt[3]{x} + \sqrt[3]{xy} = 4y^2$
- (h) $\sqrt{xy} + 2x = \sqrt{y}$
- (i) $y = \cos(x-y)$
- (j) $\cos(x+y) = y \sin(x)$
- (k) $2x^3 + 3xy^3 = 5$
- (l) $x^2y^3 = x^4 - y^4$
- (m) $x^6 - 2x = 3y^6 + y^5 - y^2$
- (n) $3x^4y^2 - 7xy^3 = 4 - 8y$
- (ñ) $x \cos y + y \cos x = 1$
- (o) $(x+y)^2 - (x-y)^2 = x^4 + y^4$
- (p) $\frac{y}{\sqrt{x}-y} = 2 + x^2$
- (q) $x^2 = \frac{x+2y}{x-2y}$

7.- En cada uno de los siguientes ejercicios, obtenga primero y' , y luego el valor de y' en el punto $P(x, y)$ que se especifica.

- (a) $16x^4 + y^4 = 32$, $P(1, 2)$.
- (b) $9x^3 - y^3 = 1$, $P(1, 2)$.
- (c) $x^2 + xy + y^2 - 3y = 10$, $P(2, 3)$.
- (d) $16x^4 + y^4 = 32$, $P(2, -32)$.