

DERIVADAS (con SOLUCIONES)

■ Hallar las derivadas simplificadas de las siguientes funciones:

1. $y=3$	$(y'=0)$	20. $y=(x+1)^5$	$(y'=5(x+1)^4)$
2. $y=x$	$(y'=1)$	21. $y=(2x^2-3x+1)^3$	$(y'=3(2x^2-3x+1)^2(4x-3))$
3. $y=5x$	$(y'=5)$	22. $y=(x^2+1)^{100}$	$(y'=200x(x^2+1)^{99})$
4. $y=x^3$	$(y'=3x^2)$	23. $y=\frac{x+1}{x-1}$	$(y'=\frac{-2}{(x-1)^2})$
5. $y=x^4+x^3+x^2+x+1$	$(y'=4x^3+3x^2+2x+1)$	24. $y=\frac{1}{x^2+1}$	$(y'=\frac{-2x}{(x^2+1)^2})$
6. $y=4x^4-x^3+3x^2-7$	$(y'=16x^3-3x^2+6x)$	25. $y=3\frac{2x^2-1}{x^3+1}$	$(y'=3\frac{-2x^4+3x^2+4x}{(x^3+1)^2})$
7. $y=-\frac{x^5}{5}+4x^4-\frac{x^3}{6}+\frac{x^2}{2}-3$	$(y'=-x^4+16x^3-\frac{1}{2}x^2+x)$	26. $y=\left(\frac{2x-3}{x+4}\right)^4$	$(y'=\frac{44(2x-3)^3}{(x+4)^5})$
8. $y=3(x^2+x+1)$	$(y'=3(2x+1))$	27. $y=\sqrt{x^2+1}$	$(y'=\frac{x}{\sqrt{x^2+1}})$
9. $y=4(3x^3-2x^2+5)+x^2+1$	$(y'=36x^2-14x)$	28. $y=2\sqrt{x^3-x^2+1}(2x^2+3)$	$(y'=\frac{14x^4-12x^3+9x^2+2x}{\sqrt{x^3-x^2+1}})$
10. $y=\frac{2x^3-3x^2+4x-5}{2}$	$(y'=3x^2-3x+2)$	29. $y=\frac{x^3}{3}-\frac{3x^4}{4}+\frac{x^2}{2}-\frac{1}{x}$	$(y'=-3x^3+x^2+x+1/x^2)$
11. $y=(x^2+1)(2x^3-4)$	$(y'=10x^4+6x^2-8x)$	30. $y=2/x$	$(y'=-2/x^2)$
12. $y=1/x$	$(y'=-1/x^2)$	31. $y=3(x^2-x+1)(x^2+x-1)$	$(y'=3(4x^3-2x+2))$
13. $y=1/x^3$	$(y'=-3/x^4)$	32. $y=\frac{x^2-1}{x^2+1}$	$(y'=\frac{4x}{(x^2+1)^2})$
14. $y=2/x^5$	$(y'=-10/x^6)$	33. $y=x/2$	$(y'=1/2)$
15. $y=\frac{2}{x^3}+\frac{1}{x^2}-\frac{3}{x}$	$(y'=\frac{3x^2-2x-6}{x^4})$	34. $y=\frac{1}{x}+\frac{2}{x^2}+\frac{3}{x^3}$	$(y'=-\frac{1}{x^2}-\frac{4}{x^3}-\frac{9}{x^4})$
16. $y=\sqrt{x}$	$(y'=\frac{1}{2\sqrt{x}})$	35. $y=(2x^2-1)(x^2-2)(x^3+1)$	$(y'=14x^6-25x^4+8x^3+6x^2-10x)$
17. $y=\sqrt[3]{x^2}$	$(y'=\frac{2}{3\sqrt[3]{x}})$	36. $y=\sqrt{\frac{1-x^3}{x^2+1}}$	$(y'=\frac{(-x^4-3x^2-2x)\sqrt{x^2+1}}{2(x^2+1)^2\sqrt{1-x^3}})$
18. $y=\sqrt[5]{x^3}$	$(y'=\frac{3}{5\sqrt[5]{x^2}})$	37. $y=(x^2+1)(3x+2)^3$	$(y'=(3x+2)^2(15x^2+4x+9))$
19. $y=2\sqrt[3]{x^2}-3x^2+\frac{1}{5}$	$(y'=\frac{4}{3\sqrt[3]{x}}-6x)$	38. $y=(3x^2+2)(2x+1)^3$	$(y'=(2x+1)^2(30x^2+6x+12))$

39. $y = \frac{1}{3x^5 - x^3 + 2}$	$\left(y' = \frac{-15x^4 + 3x^2}{(3x^5 - x^3 + 2)^2} \right)$	55. $y = \frac{2x^2 + 1}{x^2 - 4}$	$\left(y' = \frac{-18x}{(x^2 - 4)^2} \right)$
40. $y = \sqrt{x^4 - 2x^2 + 3}$	$\left(y' = \frac{2x^3 - 2x}{\sqrt{x^4 - 2x^2 + 3}} \right)$	56. $y = 2(3x^2 - 2)^3$	$(y' = 324x^5 - 432x^3 + 144x)$
41. $y = \sqrt{\frac{x^2 + 1}{x^2 - 1}}$	$\left(y' = \frac{-2x\sqrt{x^2 - 1}}{(x^2 - 1)^2 \sqrt{x^2 + 1}} \right)$	57. $y = \frac{x + 2}{\sqrt{x + 1}}$	$\left(y' = \frac{x}{2(x + 1)\sqrt{x + 1}} \right)$
42. $y = \sqrt[5]{x^2 + 1}$	$\left(y' = \frac{2}{5\sqrt[5]{x^3}} \right)$	58. $y = \frac{3}{x^3} - \frac{2}{x^2} + \frac{4}{x}$	$\left(y' = \frac{-4x^2 + 4x - 9}{x^4} \right)$
43. $y = \frac{x^4 - 2x^2 + 1}{5}$	$\left(y' = \frac{4x^3 - 4x}{5} \right)$	59. $y = \frac{x^5}{5} - \frac{x^3}{3} + \frac{x^2}{2} - \frac{x}{5} + \sqrt{x}$	
44. $y = \frac{5}{x^4 - 2x^2 + 1}$	$\left(y' = \frac{20x - 20x^3}{(x^4 - 2x^2 + 1)^2} \right)$	60. $y = \sqrt[3]{(x^3 - 2)^2}$	
45. $y = 3(x + 1)^3 \sqrt[3]{x + 1}$	$\left(y' = 10\sqrt[3]{(x + 1)^7} \right)$	61. $y = \sqrt{\frac{2}{x}}$	
46. $y = x^3 \sqrt{x}$	$\left(y' = \frac{7x^2 \sqrt{x}}{2} \right)$	62. $y = 1 + \frac{x^3 - 3}{x^3 + 2}$	
47. $y = \sqrt[3]{\frac{1}{2x + 1}}$	$\left(y' = -\frac{2}{3\sqrt[3]{(2x + 1)^4}} \right)$	63. $y = \left(\frac{x + 1}{x - 1} \right)^3$	
48. $y = 2x(x^2 + 1)(2x - 1)(x + 2)$		64. $y = \sqrt[4]{x^3} + \frac{1}{2x^2}$	
49. $y = 3 \frac{(x - 1)^2(x + 2)}{x + 1}$	$\left(y' = 3 \frac{2x^3 + 3x^2 - 5}{(x + 1)^2} \right)$	65. $y = \frac{\sqrt{x + 1}}{x + 2}$	
50. $y = \frac{2x + 4}{\sqrt{x + 3}}$	$\left(y' = \frac{x + 4}{\sqrt{(x + 3)^3}} \right)$	66. $y = \frac{x + 2}{\sqrt{x + 1}}$	
51. $y = \frac{3x^4}{4} - \frac{2x^3}{3} + \frac{x^2}{2} - \frac{x}{5} + \frac{1}{x}$	$(y' = 3x^3 - 2x^2 + x - 1/5 - 1/x^2)$	67. $y = (x^2 - 3)^3 (2x - 1)$	
52. $y = \sqrt[4]{(x^4 - 1)^3}$	$\left(y' = \frac{3x^3}{\sqrt[4]{x^4 - 1}} \right)$	68. $y = \frac{1}{2\sqrt{x}}$	
53. $y = \frac{1}{(x^2 + 1)^3}$	$\left(y' = \frac{-6x}{(x + 1)^4} \right)$	69. $y = \frac{x^2 + x + 1}{x^2 - x + 1}$	
54. $y = \frac{2x^2 - 3}{3x^2 - 2}$	$\left(y' = \frac{10x}{(3x^2 - 2)^2} \right)$	70. $y = \sqrt[3]{x^2 + 1}$	
		71. $y = \sqrt[3]{\frac{2}{x}}$	$\left(y' = -\frac{\sqrt[3]{4x^2}}{3x^2} \right)$