

Série 10 : exercices supplémentaires

Calculer, là où elles sont définies, les dérivées des fonctions suivantes où $y = f(x)$.

N.B. : certaines dérivées ne sont pas encore calculables (fonctions contenant e^x ou $\ln(x)$) mais ces dernières seront vues d'ici la fin du semestre en analyse 2.

1. $y = x^4 + 3x^2 - 6$
2. $y = 6x^3 - x^2$
3. $y = \frac{x^5}{a-b} - \frac{x^2}{a-b} - x$
4. $y = \frac{x^3 - x^2 + 1}{5}$
5. $y = 2ax^3 - \frac{x^2}{b} + c$
6. $y = 6x^{7/2} + 4x^{5/2} + 2x$
7. $y = \sqrt{3x} + \sqrt[3]{x} + \frac{1}{x}$
8. $y = \frac{(x+1)^3}{x^{3/2}}$
9. $y = \frac{x}{m} + \frac{m}{x} + \frac{x^2}{n^2} + \frac{n^2}{x^2}$
10. $y = \sqrt[3]{x^2} - 2\sqrt{x} + 5$
11. $y = \frac{ax^2}{\sqrt[3]{x}} + \frac{b}{x\sqrt{x}} - \frac{\sqrt[3]{x}}{\sqrt{x}}$
12. $y = (1 + 4x^3)(1 + 2x^2)$
13. $y = x(2x - 1)(3x + 2)$
14. $y = (2x - 1)(x^2 - 6x + 3)$
15. $y = \frac{2x^4}{b^2 - x^2}$
16. $y = \frac{a-x}{a+x}$
17. $y = \frac{x^3}{1+x^2}$
18. $y = \frac{(x+4)^2}{x+3}$
19. $y = \frac{x^3+2}{x^2-x-2}$
20. $y = \frac{x^p}{x^m - a^m}$
21. $y = (2x^2 - 3)^2$
22. $y = (x^2 + a^2)^5$
23. $y = \sqrt{x^2 + a^2}$
24. $y = (a + x)\sqrt{a - x}$
25. $y = \sqrt{\frac{1+x}{1-x}}$
26. $y = \frac{2x^2-1}{x\sqrt{1+x^2}}$
27. $y = \sqrt[3]{x^2 + x + 1}$
28. $y = (1 + \sqrt[3]{x})^3$
29. $y = \sqrt{x + \sqrt{x + \sqrt{x}}}$
30. $y = \sin^2(x)$
31. $y = 2\sin(x) + \cos(3x)$
32. $y = \tan(ax + b)$
33. $y = \frac{\sin(x)}{1+\cos(x)}$
34. $y = \sin(2x) \cos(3x)$
35. $y = \cot^2(5x)$
36. $y = x \sin(x) + \cos(x)$
37. $y = \sin^3(x) \cos(x)$
38. $y = a\sqrt{\cos(2x)}$
39. $y = a \sin^3(\frac{x}{3})$
40. $y = \frac{\tan(\frac{x}{2}) + \cot(\frac{x}{2})}{x}$
41. $y = a(1 - \cos^2(\frac{x}{2}))^2$
42. $y = \frac{1}{2} \tan^2(x)$
43. $y = \ln(\cos(x))$
44. $y = \ln(\tan(x))$
45. $y = \ln(\sin^2(x))$
46. $y = \cos(x)(\tan(x) - 1)$
47. $y = \ln(\sqrt{\frac{1+\sin(x)}{1-\sin(x)}})$
48. $y = \ln(\tan(\frac{\pi}{4} + \frac{x}{2}))$
49. $y = \sin(x + a) \cos(x + a)$

50. $y = \sin(\ln(x))$

51. $y = \tan(\ln(x))$

52. $y = \sin(\cos(x))$

53. $y = \frac{1}{3} \tan^3(x) - \tan(x) + x$

54. $y = (x \cot(x))^2$

55. $y = \ln(ax + b)$

56. $y = \log_a(x^2 + 1)$

57. $y = \ln\left(\frac{1+x}{1-x}\right)$

58. $y = \log_3(x^2 - \sin(x))$

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

60. $y = \ln(x^2 + x)$

61. $y = \ln(x^3 - 2x + 5)$

62. $y = x \ln(x)$

63. $y = \ln^3(x)$

64. $y = \ln(x + \sqrt{1+x^2})$

65. $y = \ln(\ln(x))$

66. $y = \ln\left(\sqrt{\frac{1+x}{1-x}}\right)$

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

68. $y = \sqrt{a^2 + x^2} - a \ln\left(\frac{a + \sqrt{x^2 + a^2}}{x}\right)$

69. $y = \ln(x + \sqrt{x^2 + a^2}) - \frac{\sqrt{x^2 + a^2}}{x}$

70. $y = -\frac{\cos(x)}{2 \sin^2(x)} + \frac{1}{2} \ln\left(\tan\left(\frac{x}{2}\right)\right)$

71. $y = \frac{\sin(x)}{2 \cos^2(x)}$

72. $y = \frac{1}{2} \tan^2(x) + \ln(\cos(x))$

73. $y = e^{ax}$

74. $y = e^{4x+5}$

75. $y = a^{x^2}$

76. $y = 7^{x^2+2x}$

77. $y = c^{a^2-x^2}$

78. $y = ae^{\sqrt{x}}$

79. $y = a^x$

80. $y = a^{\ln(x)}$

81. $y = e^x(1 - x^2)$

82. $y = \frac{e^x - 1}{e^x + 1}$

83. $y = \ln\left(\frac{e^x}{1+e^x}\right)$

84. $y = \frac{a}{2}(e^{\frac{x}{a}} - e^{-\frac{x}{a}})$

85. $y = e^{\sin(x)}$

86. $y = a^{\tan(nx)}$

87. $y = e^{\cos(x)} \sin(x)$

88. $y = e^x \ln(\sin(x))$

89. $y = x^n e^{\sin(x)}$

90. $y = x^x$

91. $y = x^{\frac{1}{x}}$

92. $y = x^{\ln(x)}$

93. $y = e^{x^x}$

94. $y = \left(\frac{x}{n}\right)^{nx}$

95. $y = x^{\sin(x)}$

96. $y = (\sin(x))^x$

97. $y = (\sin(x))^{\tan(x)}$

98. $y = \tan\left(\frac{1-e^x}{1+e^x}\right)$

99. $y = \sin(\sqrt{1-2^x})$

100. $y = 10^{x \tan(x)}$

101. $y = \arcsin\left(\frac{x}{a}\right)$

102. $y = (\arcsin(x))^2$

103. $y = \arctan(x^2 + 1)$

104. $y = \arctan\left(\frac{2x}{1-x^2}\right)$

105. $y = \arccos(x^2)$

106. $y = \frac{\arccos(x)}{x}$

107. $y = \arcsin\left(\frac{x+1}{\sqrt{2}}\right)$

108. $y = x\sqrt{a^2 - x^2} + a^2 \arcsin(\frac{x}{a})$, pour $a > 0$
109. $y = \sqrt{a^2 - x^2} + a \arcsin(\frac{x}{a})$, pour $a > 0$
110. $y = \arctan(\frac{x+a}{1-ax})$
111. $y = \frac{1}{\sqrt{3}} \arctan(\frac{x\sqrt{3}}{1-x^2})$
112. $y = x \arcsin(x)$
113. $y = \arccos(\ln(x))$
114. $y = \arcsin(\sqrt{\sin(x)})$
115. $y = \arctan\left(\sqrt{\frac{1-\cos(x)}{1+\cos(x)}}\right)$
pour $x \in [0, \pi[$
116. $y = e^{\arctan(x)}$
117. $y = \arctan\left(\frac{e^x - e^{-x}}{2}\right)$
118. $y = x^{\arcsin(x)}$
119. $y = \arcsin(\sin(x))$
120. $y = \arctan\left(\frac{4\sin(x)}{3+5\cos(x)}\right)$
121. $y = \arctan(\frac{a}{x}) + \ln\left(\sqrt{\frac{x-a}{x+a}}\right)$
122. $y = \ln\left(\left(\frac{1+x}{1-x}\right)^{1/4}\right) - \frac{1}{2} \arctan(x)$
123. $y = \frac{3x^2-1}{3x^3} + \ln(\sqrt{1+x^2}) + \arctan(x)$
124. $y = \frac{1}{3} \ln\left(\frac{x+1}{\sqrt{x^2-x+1}}\right) + \frac{1}{\sqrt{3}} \arctan(\frac{2x-1}{\sqrt{3}})$
125. $y = \ln\left(\frac{1+x\sqrt{2}+x^2}{1-x\sqrt{2}+x^2}\right) + 2 \arctan\left(\frac{x\sqrt{2}}{1-x^2}\right)$
126. $y = \arccos\left(\frac{x^{2n}-1}{x^{2n}+1}\right)$
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