Esercizi su calcolo di derivate

In ciascuno dei seguenti casi, calcolare la derivata f' (specificando dove esiste) di f:

1. $f(x) = 5x^4 - 2x^3 + x - 1$

2. $f(x) = x - \dfrac{2}{x} + \dfrac{5}{x^3}$

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

4. $f(x) = \dfrac{2x^2+5x+3}{x^3-x}$

5. $f(x) = x + \sqrt{x}$

6. $f(x) = x\sqrt{x+1}$

7. $f(x) = \dfrac{x-1}{\sqrt{x+2}}$

8. $f(x) = \sqrt[3]{x^2-4}$

9. $f(x) = \dfrac{x+4}{\sqrt{x^2+x}}$

10. $f(x) = \sqrt{\dfrac{2x-3}{3x+5}}$

11. $f(x) = \dfrac{x^3-\sqrt{x+1}}{\sqrt{x^4+x}}$

12. $f(x) = \sin(2x)$

13. $f(x) = \cos(x+1)$

14. $f(x) = \cos^3(x)$

15. $f(x) = x\sin^2(x)$

16. $f(x) = \cos(x - x^3)$

17. $f(x) = \dfrac{x^2}{\sin x}$

18. $f(x) = \cos(\sin(x))$

19. $f(x) = \cos(1/x)$

20. $f(x) = \sin(\sqrt{x})$

21. $f(x) = \tan(\sqrt{x-1})$

22. $f(x) = \sin\left(\dfrac{x^2}{e-2x}\right)$

23. $f(x) = \log(x^2+3x+1)$

24. $f(x) = (x-2)\log x$

25. $f(x) = \log|2x-1|$

26. $f(x) = \dfrac{x}{\log x}$

27. $f(x) = \sin(\log(x))$

28. $f(x) = \dfrac{1+\log x}{2-\log x}$

29. $f(x) = \dfrac{\log(2x+5)}{\log(x^2+1)}$

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

31. $f(x) = \log\left(\dfrac{x^5+3x^2+1}{x^3-1}\right)$

32. $f(x) = e^{3x-2}$

33. $f(x) = \log(e^x+1)$

34. $f(x) = \log(1+\sqrt{x-2x^2})$

35. $f(x) = xe^{\sin x}$

36. $f(x) = 2^{x^2+x}$

37. $f(x) = e^{2x^3+x+\sqrt{x}}$

38. $f(x) = (x+1)e^{x^2-x}$

39. $f(x) = e^{\frac{x+1}{x+3}}$

40. $f(x) = e^{1/\sqrt{x-2}}$

41. $f(x) = e^{-1/\sqrt{x}}$

42. $f(x) = (1+x^2)^{\sqrt{x}}$

43. $f(x) = \dfrac{x^2+2x}{3x-4}e^{\sqrt{1+\log^2 x}}$

44. $f(x) = \arctan(x+3)$

45. $f(x) = \dfrac{x+\sqrt{x^2+1}}{1+e^{2x+3}}$

46. $f(x) = \arctan(1-\log(\sqrt{x}))$

47. $f(x) = \tan^2(x)$

48. $f(x) = e^{-1/x^2}$