# Chain Rule Again

Differentiate the following.

1. $f(x) = (x-5)^3(x+3)^2$
2. $f(x) = (x-5)^4(x+3)^3$
3. $f(x) = (1+2x^3)^4$
4. $f(x) = (1+3x^2)^4$
5. $f(x) = \frac{sin^2(x)}{\cos(x)}$
6. $f(x) = \frac{cos^2(x)}{\sin(x)}$
7. $f(x) = 2xsin(x^2)$
8. $f(x) = 3xcos(x^2)$
9. $f(x) = x^4sin(2x)$
10. $f(x) = x^4cos(3x)$
11. $f(x) = sec(\sqrt{x})$
12. $f(x) = tan(\sqrt{x})$
13. $f(x) = \sqrt{1-sec(4x)}$
14. $f(x) = \sqrt{1+sec(2x)}$

15. $f(x) = \sqrt[3]{1 - tan(x^2)}$

16. $f(x) = \sqrt[3]{1 + tan(x^2)}$

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

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

19. $f(x) = sin(4x)cos(2x)$

20. $f(x) = sin(5x)cos(4x)$

21. $f(x) = sec(x^2)tan(x^3)$

22. $f(x) = csc(x^2)cot(x^3)$

23. $f(x) = \sqrt{\frac{x-1}{x+1}}$

24. $f(x) = \sqrt{\frac{x+1}{x-1}}$

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

26. $f(x) = \frac{x}{\sqrt{x^2-1}}$

27. $f(x) = sin\left(\frac{1}{x}\right)$

28. $f(x) = cos\left(\frac{1}{x}\right)$

29. $f(x) = sin^2(8x)$

30. $f(x) = cos^2(3x)$

31. $f(x) = tan^4(3x)$

32. $f(x) = tan^5(2x)$

33. $f(x) = sec^2(x) + tan^2(x)$

34. $f(x) = csc^2(x) + cot^2(x)$

35. $f(x) = sin^2(x) + \sin(x^2)$

36. $f(x) = cos^3(x) + \cos(x^3)$

37. $f(x) = (1 - sin^2(x))^5$

38. $f(x) = (1 - cos^2(x))^4$

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

40. $f(x) = x\sqrt{1 + 2x^5}$