DERIVATIVE RULES

1. f(x) = k; (k is a constant)   f'(x) = 0

2. f(x) = x^n f'(x) = nx^{n-1}

3. f(x) = k(g(x))   f'(x) = $kg'(x)$

4. f(x) = g(x) + h(x)   f'(x) = $g'(x)+h'(x)$

5. f(x) = g(x) - h(x)   f'(x) = $g'(x)-h'(x)$

6. f(x) = g(x) * h(x)   f'(x) = $g'(x)h(x)+h'(x)g(x)$

7. f(x) = x^{-n} f'(x) = $-nx^{-n-1}$

8. f(x) = g(h(x))   f'(x) = $g'(h(x))\cdot h'(x)$

9. f(x) = g(x)^n f'(x) = $rg(x)^{r-1}\cdot g'(x)$

10. f(x) = x$^{m/n}$ f'(x) = $\dfrac{m}{n}x^{\frac{m}{n}-1}$

11. f(x) = (g(x))$^{m/n}$ f'(x) = $\dfrac{m}{n}(g(x))^{\frac{m}{n}-1}\cdot g'(x)$

12. f(x) = ln x   f'(x) = $\dfrac{1}{x}$

13. f(x) = ln (g(x))   f'(x) = $\dfrac{1}{g(x)}\cdot g'(x)$

14. f(x) = ln^{n}g(x) or (ln g(x))^n f'(x) = $r(\ln g(x))^{r-1}\cdot\dfrac{1}{g(x)}\cdot g'(x)$

15. f(x) = e^x f'(x) = e^x

16. f(x) = e$^{g(x)}$ f'(x) = $e^{g(x)}\cdot g'(x)$

17. f(x) = a^x; (a is a constant)   f'(x) = $\dfrac{1}{a^5\ln a}$

18. f(x) = a$^{g(x)}$ f'(x) = $\dfrac{1}{g(x)\ln a}\cdot g'(x)$

19. f(x) = log$_a$x   f'(x) = $\dfrac{1}{x \ln a}$

20. f(x) = log$_a$ g(x)   f'(x) = $\dfrac{1}{g(x)\ln a} \cdot g'(x)$

21. f(x) = sin x   f'(x) = $\cos x$

22. f(x) = sin (g(x))   f'(x) = $\cos(g(x)) \cdot g'(x)$

23. f(x) = sin^{n}x or (sin x)^n f'(x) = $n(\sin x)^{n-1} \cdot \cos x$

24. f(x) = sin^n(g(x))   f'(x) = $n(\sin g(x))^{n-1} \cdot \cos g(x) \cdot g'(x)$

25. f(x) = cos x   f'(x) = $-\sin x$

26. f(x) = cos (g(x))   f'(x) = $-\sin(g(x)) \cdot g'(x)$