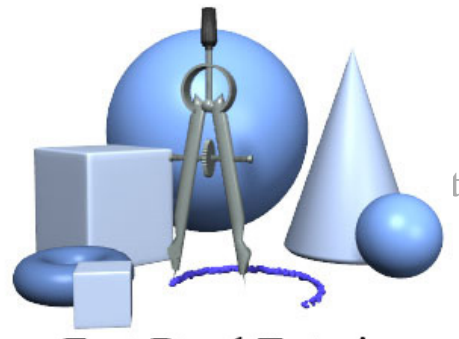


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Basic Differentiation Rules

1. $\frac{d}{dx}[fg] = f'g + fg'$ Product Rule

2. $\frac{d}{dx}\left[\frac{f}{g}\right] = \frac{f'g - fg'}{g^2}$ Quotient Rule

3. $\frac{d}{dx}[x^n] = nx^{n-1}$ Power Rule

4. $\frac{d}{dx}[u^n] = nu^{n-1}u'$ Chain Rule

5. $\frac{d}{dx}[c] = 0$ Constant Rule

6. $\frac{d}{dx}[cu] = cu'$ Scalar Multiple

7. $\frac{d}{dx}[f \pm g] = f' \pm g'$ Sum/Diff

8. $\frac{d}{dx}[x] = 1$

9. $\frac{d}{dx}[|u|] = \frac{u}{|u|}(u'), u \neq 0$ Abs. Value

10. $\frac{d}{dx}[\ln u] = \frac{u'}{u}$ Natural Log

11. $\frac{d}{dx}[\ln |u|] = \frac{u'}{u}$ Nat. Log/Abs

12. $\frac{d}{dx}[e^u] = e^u u'$ Exponential

13. $\frac{d}{dx}[\log_a u] = \frac{u'}{(\ln a)u}$ Logarithm

14. $\frac{d}{dx}[a^u] = (\ln a)a^u u'$

15. $\frac{d}{dx}[\sin u] = (\cos u)u'$

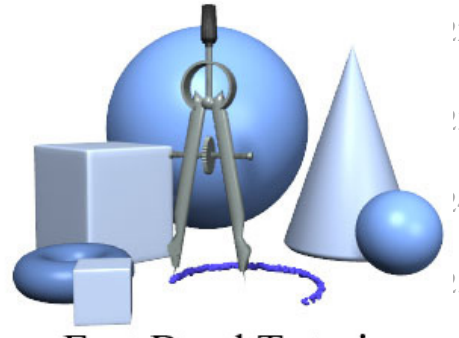
16. $\frac{d}{dx}[\cos u] = -(\sin u)u'$

17. $\frac{d}{dx}[\tan u] = (\sec^2 u)u'$

18. $\frac{d}{dx}[\cot u] = -(\csc^2 u)u'$

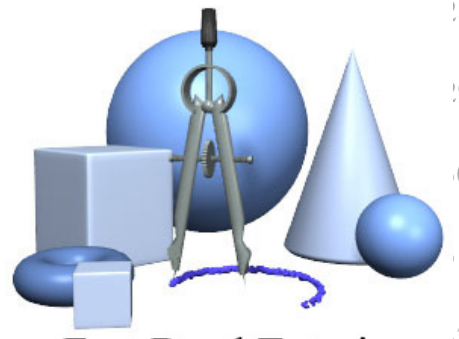
19. $\frac{d}{dx}[\sec u] = (\sec u \tan u)u'$

SAMPLE



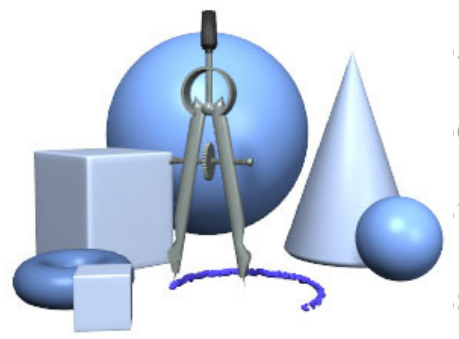
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20. $\frac{d}{dx}[\csc u] = -(\csc u \cot u)u'$

21. $\frac{d}{dx}[\arcsin u] = \frac{u'}{\sqrt{1-u^2}}$

22. $\frac{d}{dx}[\arccos u] = \frac{-u'}{\sqrt{1-u^2}}$

23. $\frac{d}{dx}[\arctan u] = \frac{u'}{1+u^2}$

24. $\frac{d}{dx}[\text{arccot } u] = \frac{-u'}{1+u^2}$

25. $\frac{d}{dx}[\text{arcsec } u] = \frac{u'}{|u|\sqrt{u^2-1}}$

26. $\frac{d}{dx}[\text{arccsc } u] = \frac{-u'}{|u|\sqrt{u^2-1}}$

27. $\frac{d}{dx}[\sinh u] = (\cosh u)u'$

28. $\frac{d}{dx}[\cosh u] = (\sinh u)u'$

29. $\frac{d}{dx}[\tanh u] = (\text{sech}^2 u)u'$

30. $\frac{d}{dx}[\text{coth } u] = -(\text{csch}^2 u)u'$

31. $\frac{d}{dx}[\text{sech } u] = -(\text{sech } u \tanh u)u'$

32. $\frac{d}{dx}[\text{csch } u] = -(\text{csch } u \text{coth } u)u'$

33. $\frac{d}{dx}[\sinh^{-1} u] = \frac{u'}{\sqrt{u^2+1}}$

34. $\frac{d}{dx}[\cosh^{-1} u] = \frac{u'}{\sqrt{u^2-1}}$

35. $\frac{d}{dx}[\tanh^{-1} u] = \frac{u'}{1-u^2}$

36. $\frac{d}{dx}[\text{coth}^{-1} u] = \frac{u'}{1-u^2}$

37. $\frac{d}{dx}[\text{sech}^{-1} u] = \frac{-u'}{u\sqrt{1-u^2}}$

38. $\frac{d}{dx}[\text{csch}^{-1} u] = \frac{-u'}{|u|\sqrt{1+u^2}}$