

Basic Forms from Calculus I

$$1. \frac{d}{dx}[k] = 0$$

$$2. \frac{d}{dx}[x^n] = n x^{n-1}$$

$$3. \frac{d}{dx}[k u] = k u'$$

$$4. \frac{d}{dx}[u \pm v] = u' \pm v'$$

$$5. \frac{d}{dx}[u v] = u v' + v u'$$

$$6. \frac{d}{dx}\left[\frac{u}{v}\right] = \frac{v u' - u v'}{v^2}$$

$$7. \frac{d}{dx}[f(u)] = f'(u) \cdot u'$$

$$8. \frac{d}{dx}[e^u] = e^u u'$$

$$9. \frac{d}{dx}[\ln(u)] = \frac{1}{u} u'$$

$$10. \frac{d}{dx}[\sin(u)] = \cos(u) u'$$

$$11. \frac{d}{dx}[\csc(u)] = -\csc(u) \cot(u) u'$$

$$12. \frac{d}{dx}[\cos(u)] = -\sin(u) u'$$

$$13. \frac{d}{dx}[\sec(u)] = \sec(u) \tan(u) u'$$

$$14. \frac{d}{dx}[\tan(u)] = \sec^2(u) u'$$

$$15. \frac{d}{dx}[\cot(u)] = -\csc^2(u) u'$$

$$16. \frac{d}{dx}[\sin^{-1}(u)] = \frac{u'}{\sqrt{1-u^2}}$$

$$17. \frac{d}{dx}[\tan^{-1}(u)] = \frac{u'}{1+u^2}$$

$$18. \frac{d}{dx}[\sec^{-1}(u)] = \frac{u'}{|u|\sqrt{u^2-1}}$$

$$19. \int k \, du = k u + c$$

$$20. \int u^n \, du = \frac{u^{n+1}}{n+1} + c \quad n \neq -1$$

$$21. \int k f(u) \, du = k \int f(u) \, du$$

$$22. \int [f(u) \pm g(u)] \, du = \int f(u) \, du \pm \int g(u) \, du$$

$$23. \int e^u \, du = e^u + C$$

$$24. \int \frac{1}{u} \, du = \ln|u| + C$$

$$25. \int u^{-1} \, du = \ln|u| + C$$

$$26. \int \sin(u) \, du = -\cos(u) + C$$

$$27. \int \csc(u) \cot(u) \, du = -\csc(u) + C$$

$$28. \int \cos(u) \, du = \sin(u) + C$$

$$29. \int \sec(u) \tan(u) \, du = \sec(u) + C$$

$$30. \int \tan(u) \, du = \ln|\sec(u)| + C$$

$$31. \int \cot(u) \, du = \ln|\sin(u)| + C$$

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$$32. \int \sec^2(u) \, du = \tan(u) + C$$

$$33. \int \csc^2(u) \, du = -\cot(u) + C$$

$$34. \int \sec(u) \, du = \ln|\sec(u) + \tan(u)| + C$$

$$35. \int f(au + b) \, du = \frac{1}{a} F(au + b) + C$$

$$36. \int \frac{du}{\sqrt{a^2 - u^2}} = \sin^{-1}\left(\frac{u}{a}\right) + C$$

$$37. \int \frac{1}{a^2 + u^2} \, du = \frac{1}{a} \tan^{-1}\left(\frac{u}{a}\right) + C$$

$$38. \int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} \sec^{-1}\left(\frac{|u|}{a}\right) + C$$

To Be Introduced in Chapter 8:

$$39. \int \ln(u) \, du = u \ln(u) - u + C$$

$$40. \int \sec^3(u) \, du = \frac{1}{2} \left[\sec(u) \tan(u) + \ln|\sec(u) + \tan(u)| \right] + C$$