

Integral Math Facts (AB)

Find the integral of the following functions. Don't forget the Constant of Integration!

$$1. \int \sin(x)dx = -\cos(x) + C$$

$$2. \int \cos(x)dx = \sin(x) + C$$

$$3. \int \sec^2(x)dx = \tan(x) + C$$

$$4. \int \sec(x) \tan(x)dx = \sec(x) + C$$

$$5. \int \tan(x)dx = -\ln(\cos x) + C = \ln(\sec x) + C$$

$$6. \int \frac{1}{x} dx = \ln|x| + C$$

$$7. \int \sqrt{x}dx = \frac{2}{3}x^{\frac{3}{2}} + C$$

$$8. \int x^n dx = \frac{x^{n+1}}{n+1} + C \text{ where } n \text{ is an integer and } n \neq -1$$

$$9. \int \frac{1}{\sqrt{3x+1}} dx = \frac{2}{3}\sqrt{3x+1} + C$$

$$10. \int \frac{1}{\sqrt{9-x^2}} dx = \arcsin\left(\frac{x}{3}\right) + C$$

$$11. \int \frac{1}{1+x^2} dx = \arctan(x) + C$$

$$12. \int \frac{-1}{\sqrt{16-x^2}} dx = \arccos\left(\frac{x}{4}\right) + C$$

$$13. \int 5^{3x} dx = \frac{1}{3\ln(5)}5^{3x} + C$$

$$14. \int_0^1 (5x-2)^3 dx = \frac{1}{20}(5x-2)^4 \Big|_{x=0}^{x=1} = \frac{1}{20}[3^4 - (-2)^4] = \frac{65}{20} = \frac{13}{4}$$

$$15. \int_5^7 \frac{5}{x+2} dx = 5 \ln(x+2) \Big|_{x=5}^{x=7} = 5[\ln(9) - \ln(7)] = 5 \ln\left(\frac{9}{7}\right)$$