

Integration Using a Table of Integrals

"Answer Key"

$$1. \int \frac{1}{x\sqrt{5x+7}} dx = \frac{1}{\sqrt{7}} \ln \left| \frac{\sqrt{5x+7} - \sqrt{7}}{\sqrt{5x+7} + \sqrt{7}} \right| + A$$

$$2. \int \frac{1}{x^2\sqrt{2x-3}} dx = \frac{\sqrt{2x-3}}{3x} + \frac{2}{3\sqrt{3}} \arctan\left(\sqrt{\frac{2}{3}x-1}\right) + B$$

$$3. \int \frac{1}{(4+x^2)^2} dx = \frac{x}{8(x^2+4)} + \frac{1}{16} \arctan(x/2) + C$$

$$4. \int x^2 \sqrt{16+x^2} dx = 2\sqrt{x^2+16} + \frac{1}{4}x^3\sqrt{x^2+16} - 32 \ln\left(\frac{x}{4} + \sqrt{1+\frac{x^2}{16}}\right) + D$$

$$5. \int \frac{\sqrt{x^2-25}}{x} dx = \sqrt{x^2-25} - 5 \operatorname{arcsec}\left|\frac{x}{5}\right| + E$$

$$6. \int \frac{1}{x\sqrt{x^2-1}} dx = -\arctan\left(\frac{1}{\sqrt{x^2-1}}\right) + F = \operatorname{arcsec}|x| + G$$

$$7. \int \frac{1}{7+3\sin\theta} d\theta = \cancel{\frac{1}{7+3\sin\theta}} = \frac{-1}{\sqrt{40}} \arctan\left[\frac{2}{\sqrt{10}} \tan\left(\frac{\pi}{4}-\theta\right)\right] + H$$

$$8. \int \csc(5x) dx = \frac{1}{5} \ln|\sin(\frac{5}{2}x)| - \frac{1}{5} \ln|\cos(\frac{5}{2}x)| + I$$

$$9. \int \csc^3(2x) dx = \frac{-1}{16} \csc^2(x) + \frac{\sec^2(x)}{16} + \frac{1}{4} \ln|\sin(x)| - \frac{1}{4} \ln|\cos(x)| + J$$

$$10. \int \csc^5(2x) dx = \frac{-1}{128} \csc^4(x) - \frac{3}{64} \csc^2(x) + \frac{1}{128} \sec^4(x) + \frac{3}{64} \sec^2(x) + \frac{3}{16} \ln|\sin(x)| - \frac{3}{16} \ln|\cos(x)| + K$$

$$11. \int \tanh(3x) dx = \frac{1}{3} \ln|\cosh(3x)| + L$$

$$12. \int \cosh^2(x) dx = \frac{1}{2}x + \frac{1}{2} \sinh(x) \cosh(x) + M$$

$$13. \int \cosh^3(2x) dx = \frac{3}{8} \sinh(2x) + \frac{1}{24} \sinh(6x) + N$$

$$14. \int x^3 \ln^2 x dx = \frac{1}{32} x^4 + \frac{1}{4} x^4 \ln^2(x) - \frac{1}{8} x^4 \ln(x) + O$$

$$15. \int \frac{\sqrt{6x-x^2}}{x^2} dx = -2\sqrt{\frac{4-x}{x}} - \arcsin\left(\frac{x-3}{3}\right) + P$$