

1. $\int x^2 \sin(3x) dx = -\frac{x^2 \cos(3x)}{3} + \frac{2x \sin(3x)}{9} + \frac{2 \cos(3x)}{27} + C$
2. $\int \sin^2 x \cos^3 x dx = \frac{\sin^3 x}{3} - \frac{\sin^5 x}{5} + C$
3. $\int \sin^{-1} x dx = x \sin^{-1} x + \sqrt{1-x^2} + C$
4. $\int \frac{2x^2 + 3x - 8}{(x-4)(x+2)^2} dx = \ln|x-4| + \ln|x+2| - \frac{1}{x+2} + C$
5. $\int \tan x dx = -\ln|\cos x| + C$
6. $\int \ln x dx = x \ln x - x + C$
7. $\int \frac{4x^2 + 5x}{(x-1)(x^2 + 2)} dx = 3 \ln|x-1| - \frac{1}{2} \ln|x^2 + 2| + 3\sqrt{2} \tan^{-1}\left(\frac{x}{\sqrt{2}}\right) + C$
8. $\int \frac{2}{(9x^2 - 1)^{3/2}} dx$
9. $\int \tan^2 x dx = \tan x - x + C$
10. $\int \frac{x}{e^x} dx = -xe^{-x} - e^{-x} + C$
11. $\int \frac{1}{x^2 \sqrt{4+x^2}} dx = -\frac{\sqrt{4+x^2}}{4x} + C$
12. $\int x^3 \ln x dx = \frac{x^4 \ln x}{4} - \frac{x^4}{16} + C$
13. $\int_0^\pi \sin^2 x dx = \frac{\pi}{2}$
14. $\int \frac{3x^2}{\sqrt{25-x^2}} dx = \frac{75}{2} \sin^{-1}\left(\frac{x}{5}\right) - \frac{3x\sqrt{25-x^2}}{2} + C$
15. $\int \frac{4x^2 + 3x - 1}{2x^2 - x - 6} dx = 2x - \frac{1}{2} \ln|2x+3| + 3 \ln|x-2| + C$
16. $\int_0^{\pi/4} \sec^4 x dx = \frac{4}{3}$