

Carry out each of the following integrations.

$$1. \int (2x+1) \sin(x^2+x+1) dx = -\cos(x^2+x+1) + C$$

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

$$3. \int \frac{1}{x(1+\ln x)^3} dx = -\frac{1}{2(1+\ln x)^2} + C$$

$$4. \int 4 - \cos^4 x \sin x dx = 4x + \frac{1}{5} \cos^5 x + C$$

$$5. \int \frac{\cos x}{\sin^3 x} dx = -\frac{1}{2} \operatorname{cosec}^2 x + C = -\frac{1}{2} \cot^2 x + C$$

$$6. \int \frac{\sqrt{1+2 \tan x}}{\cos^2 x} dx = \frac{1}{3} (1+2 \tan x)^{\frac{3}{2}} + C$$

$$7. \int \frac{\cos x}{\sqrt{\sin x}} dx = 2\sqrt{\sin x} + C$$

$$8. \int \frac{1}{x \ln x} dx = \ln |\ln |x|| + C$$

$$9. \int \frac{1}{\cos^2 x \tan^4 x} dx = -\frac{1}{3 \tan^3 x} + C$$

$$10. \int \sin^3 2x \cos 2x dx = \frac{1}{8} \sin^4 2x + C$$