You may freely use the following formulas.

$$\cos^2(x) + \sin^2(x) = 1$$
$$\cos(2x) = \cos^2(x) - \sin^2(x)$$
$$\cos^2(x) = \tfrac{1}{2}\left(1 + \cos(2x)\right)$$
$$\sin^2(x) = \tfrac{1}{2}\left(1 - \cos(2x)\right)$$
$$\tan^2(x) = \sec^2(x) - 1$$

$$\int x^n\,dx = \frac{1}{n+1}x^{n+1} + C, \;\; n \neq -1$$

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

$$\int u\;dv = uv - \int vdu$$

$$\int e^x\,dx = e^x + C$$

$$\int a^x\,dx = \frac{1}{\ln a}a^x + C$$

$$\int \ln x\,dx = x\ln x - x + C$$

$$\int \sin x\,dx = -\cos x + C$$

$$\int \cos x\,dx = \sin x + C$$

$$\int \tan x\,dx = \ln|\sec x| + C$$

$$\int \sec x\,dx = \ln|\sec x + \tan x| + C$$

$$\int \sec^2 x\,dx = \tan x + C$$

$$\int \sec x \tan x\,dx = \sec x + C$$

$$\int \frac{a}{a^2 + x^2}\,dx = \arctan\frac{x}{a} + C$$

$$\int \frac{a}{a^2 - x^2}\,dx = \frac{1}{2}\ln\left|\frac{x+a}{x-a}\right| + C$$

$$\int \frac{1}{\sqrt{a^2 - x^2}}\,dx = \arcsin\frac{x}{a} + C$$

$$\int \frac{a}{x\sqrt{x^2 - a^2}}\,dx = \operatorname{arcsec}\frac{x}{a} + C$$

$$\int \frac{1}{\sqrt{x^2 - a^2}}\,dx \ln(x + \sqrt{x^2 - a^2}) + C$$

$$\int \frac{1}{\sqrt{x^2 + a^2}}\,dx = \ln(x+\sqrt{x^2 + a^2})+C$$