The formula for integration by parts:

$\int u \, dv = uv - \int v \, du$

Some additional helpful formulas:

$\tan^2 t + 1 = \sec^2 t$

$$\int \frac{1}{a^2 + u^2} \, du = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$$

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

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

$$\cos^2 x = \frac{1}{2}[1 + (\cos(2x)]$$