Integrals You Should Know

I. Methods of Integration

   a. Substitution $\int f(x)g'(x)\,dx = \int f(u)\,du$

   b. Integrals leading to logarithms - $\int \dfrac{f'(x)}{f(x)}\,dx = \ln(f(x)) + C$

   c. Integration by parts $\int u\,dv = uv - \int v\,du$

   d. Trigonometric Integrals $\int \sin^n x\,dx, \int \cos^n x\,dx$,

   e. Trigonometric Substitution

      i. $x^2 + a^2$ - tangent substitution

      ii. $a^2 - x^2$ - sine substitution

      iii. $x^2 - a^2$ - secant substitution

   f. Integration using Partial Fraction Decomposition

II. Integrals you should be able to do (or similar ones)

$\int x^n\,dx$	$\int \dfrac{1}{x}\,dx$	$\int e^x\,dx$	$\int a^x\,dx$
$\int \sin x\,dx$	$\int \cos x\,dx$	$\int \sec^2 x\,dx$	$\int \csc^2 x\,dx$
$\int \sec x \tan x\,dx$	$\int \csc x \cot x\,dx$	$\int \sinh x\,dx$	$\int \cosh x\,dx$
$\int \tan x\,dx$	$\int \cot x\,dx$	$\int \dfrac{1}{x^2 + a^2}\,dx$	$\int \dfrac{1}{\sqrt{a^2 - x^2}}\,dx$
$\int \sec x\,dx$	$\int \ln x\,dx$	$\int x^n e^x\,dx$	$\int \dfrac{1}{x^2 - a^2}\,dx$
$\int \sin^2 x\,dx$	$\int \cos^2 x\,dx$	$\int \sin ax \cos bx\,dx$	$\int \sin ax \sin bx\,dx$